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Lahti University of Applied Sciences

Finnish Grocery Retailing Market Assessment for the Deployment of Payment Innovation

Case: Uniqul Face Recognition Payment Application

LAHTI UNIVERSITY OF APPLIED SCIENCES
Faculty of Business Studies
Degree Programme in International Business
Bachelor's Thesis
Spring 2016
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Degree Programme in International Business

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Bachelor's Thesis in International Business, 146 pages, 13 pages of appendices

Spring 2016

ABSTRACT

In 2013, MasterCard inaugurated "The Cashless Journey" project, through which it predicted that the world would soon reach the point where cash would be completely eradicated to pave way for other superior instruments. In fact, the global payment industry has already been undergoing a massive paradigmatic metamorphosis, evolving from an economically-burdensome cash orientation into a more efficient and healthy non-cash model. This "cashless journey" has consequently opened up a vast "blue ocean" for emergence of payment innovations. Acknowledging the bonanza the market might hold, the author proposes this thesis as a fulcrum for Uniqul Oy, an innovative payment service provider, to evaluate the Finnish grocery retailing market for the deployment of its breakthrough face recognition payment application.

This thesis employs a deductive approach and harnesses data from both qualitative and quantitative sources. The contents are divided into two parts: theory and empiricism. While the theoretical part explicates the market assessment tools and briefs through the Uniqul face recognition payment application, the empirical part utilizes the defined tools to assess the Finnish macro-environment and payment industry, and further delves into the Finnish customer analysis with pre-collated data from interviews with grocery retailers, internet surveys with shoppers, and ethnography at several stores in Finland.

The findings of this thesis principally justify that the Finnish grocery retailing market is decently viable for the deployment of Uniqul application. However, specifically regarding the early introduction phase, there might be some definite impediments that could lower the market viability for Uniqul application. The author, hence recommends that assessment of other markets in Finland along with a more in-depth customer analysis should be conducted before the strategic deployment decision is made.

Keywords: Finnish grocery retailing market, market assessment, payment innovations, Uniqul face recognition payment application

ACKNOWLEDGEMENTS

This thesis could not have been even half-completed if it had not been for the rigorous and indefatigable support from distinct individuals. I would like to express my sincerest gratitude to all these persons.

First and foremost, I must thank Mr. Riku Nummikoski for all his exceptionally-prompt responses to my queries. Your instantaneity is a massive driving force behind me.

I would, as well like to reserve my appreciation to Mr. Ruslan Pisarenko, CBDO of Uniqul Oy. Your initial guidance and fervent mentorship during my internship are just indispensable.

My heartfelt gratitude also goes to my prodigious friends: M, Q, N, G, O, H, who have contributed stockpiles of comments, be them constructive or destructive.

Last and by no means least, I owe deep gratitude to my one and only LN. Thank you for your guidance, your care, your timely motivation, your anger, your encouragement, and your being you.

Sincerely,

Anh Tran

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LIST OF ABBREVIATIONS AND TERMINOLOGIES

Android	A mobile operating system currently developed Google Inc. and based on Linux Kernel
CEO	Chief Executive Officer
CFO	Chief Financial Officer
EMV	Europay, MasterCard, and Visa – A new standard for payment cards. Card data are stored on integrated circuits rather than magnetic stripes, and require either a PIN or an authorized signature to be extracted. This new standard allegedly enables safer, smarter and more secure transactions across cards. (MasterCard 2015.)
iOS	A mobile operating system developed by Apple Inc. and used exclusively for Apple devices
IPO	Initial Public Offering
NFC	Near Field Communication
R&D	Research and Development
SEPA	Single Euro Payments Area
Tokenization	A new payment security solution in which sensitive data are replaced by non-sensitive equivalents, rather than being encrypted (Weber 2014)
Uniqul	Within the context of this thesis, the term “Uniqul” alternatively refers to both: 1. Uniqul Oy 2. Uniqul face recognition payment application

1 INTRODUCTION

This chapter serves as a panoramic sketch of the thesis, in which the author depicts seven key issues: research background, objectives and research questions, research methodology and data collection, ethical matters, scope and limitations, thesis structure and theoretical framework. By the end of this chapter, readers can hopefully gain a brief insight into not only the principal content of this thesis, but also its rationale and potential influences.

1.1 Research background

During roughly the past decade, the world's payment landscape has witnessed a radical change, or to be more precise, an extreme revolution, which is prominently attributed to the robust development of advanced technology (World Payments Report 2014). According to Forbes (2014), traditional cash payment is no longer regarded as "The King" since its market proportion has been, and is being substantially superseded by non-cash transaction. Recent research conducted by Capgemini and the Royal Bank of Scotland (2014) shows a drastic increase of 33.8% in worldwide non-cash payment over just 5 years, from 250 billion transactions in 2008 up to 334.3 billion transactions by the end of 2012. Meanwhile, cash payment, on the flip side of the coin, has undergone a downslide to accounting for merely under 34% of total global consumer spend in 2011 (MasterCard 2013).

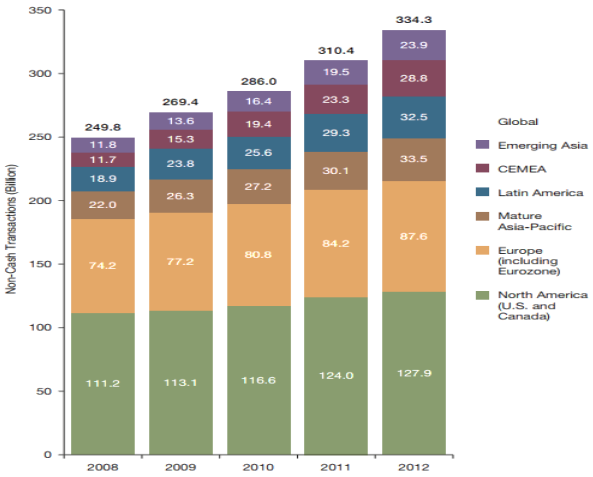


FIGURE 1. Number of Worldwide Non-Cash Transactions, 2008-2012 (Capgemini Payment Report 2014)

Today, novel payment technologies and solutions are proliferating more tremendously than ever. In 2014, an aggregate of approximately 5000 financial-technology startups along with $12 billion investment in this sector were recorded globally, tripling the corresponding figures of 2013. This boom has massively accelerated the reshaping of the payment industry very close towards the eventual destination of a cash- and wallet-free paradigm. (Capgemini Payment Service 2014; MasterCard Advisors 2014; The Economist 2015.)

Being vastly intrigued by the vision of a no-cash-no-wallet society since the author himself is an absent-minded person, who forgets his wallet more times than he actually goes shopping, coupled with the fact that he is currently doing an internship for Uniqul Oy – a face recognition payment provider, the author decides to scrutinize the possibilities of deploying the face recognition payment application in the Finnish grocery retailing section.

The selection to research the Finnish grocery retailing market is backed by a set of three reasons:

First, Finland embraces a highly-viable environment for the deployment of Uniqul face recognition payment application. Report by Capgemini and the Royal Bank of Scotland (2014) has indicated that Finland has constantly been the world’s leader in terms of the number of non-cash transactions

made per inhabitant. This figure is still growing exponentially at the rate of 10.6 % in the year of 2012, outstripping other nations in Europe and North America (e.g. the USA at 2.6%, the Netherlands at 4.6%, Denmark at 6.1%) (Capgemini Payment Service 2014).

Second, Finland is the home turf of Uniqul Oy. Hence deploying the product in Finland shall allow Uniqul to gain an edge over competitors with regards to its familiarization of customer understanding, market insights, business connections as well as local factors of production (Grunert 2006).

Third, the Finnish grocery retailing industry poses an immense market opportunity yet to be exploited. According to Statistics Finland (2013), during the period from 2006 to 2012, the population of Finland escalated by almost 150 thousand inhabitants, whilst only 39 new grocery stores were opened nationwide, resulting in a queueing congestion during peak hours in major municipalities in Finland (Finnish Grocery Trade 2013). The issue has, hence created a vast uncontested “blue ocean” for new, more time-efficient payment methods beside the traditional cash and card transactions (Kim and Mauborgne 2005).

1.2 Thesis objective and research questions

The pivotal objective of this thesis is to research, analyze and evaluate the Finnish grocery retailing market in order to prepare for the first deployment of Uniqul face recognition payment application. Hence, the core research question is formed:

How viable is the Finnish grocery retailing market for the deployment of Uniqul face recognition payment application?

So as to better elucidate the issue and ensure a comprehensive approach, the author identifies the following sub-research questions:

Q1. What are the macroeconomic opportunities and threats that Finland poses to Uniqul?

Q2. How intense is the competition in the Finnish payment industry that Uniqul has to face?

Q3. Is there a potential market demand for Uniqul face recognition payment application within the Finnish grocery retailing market?

1.3 Research methodology and data collection

Research methodology and data collection are indeed indispensable to any research as they are factors that directly turn theoretical research questions into practical projects (Robson 2011, 70). While research methodology refers to the underlying philosophy of how data are collected, analyzed and utilized, data collection essentially addresses the sources and techniques of collecting the data (Rajasekar, Philominathan and Chinnathambi 2013). Figure 2 is a simplified adaptation of the "research onion" model by Saunders, Lewis and Thornhill (2009) to demonstrate this thesis's research methodology and data collection:

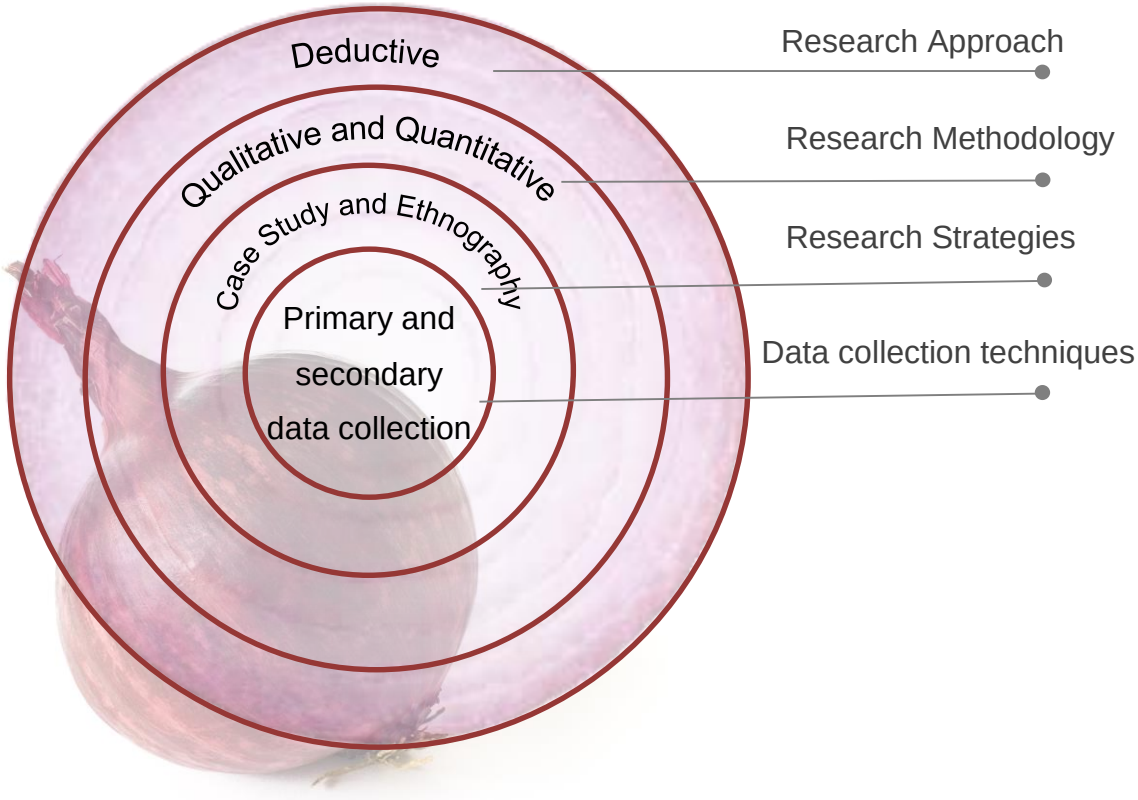


FIGURE 2. Research onion of the thesis (Simplified adaptation from Saunders, et al. (2009))

Saunders, et al. (2009) denote that the “research onion” is a metaphor to illustrate the layers of elements that researchers have to peel off in a research design. The author, however, due to the scope and nature of this thesis, has deliberately removed several layers from the original model, leaving the adapted “research onion” with four crucial layers: research approach, research methods, research strategy, and data collection techniques.

Layer 1: Research Approach: Deductive

There are two prevalent methods of reasoning: deductive and inductive approaches (Burney 2008). Deductive approach is defined as a form of inference in which the empirical research methods serve as proof to verify a hypothesis; whereas induction conversely refers to building conclusions or constructing theories from pieces of evidence (Blumberg, Cooper and Schindler 2005, 16-36; Saunders, Lewis and Thornhill 2009, 61). Burney (2008) compares these two approaches to the figure of “waterfall” as deductive – a method that works from general to more specific, and “hill-climbing” as inductive – a way that goes from specific observations to broader generalization. This thesis employs a deductive approach, with the initial hypothesis mooted as:

The Finnish grocery retailing market is decently viable for the deployment of Uniqul face recognition payment application.

Subsequently, data and valuations are collected from macroeconomic research of Finland, the Finnish payment industry scrutiny as well as customer study to ultimately verify the proposed hypothesis.

Layer 2: Research Methodology: Mixed – Qualitative and Quantitative Methods.

Research methodology is considered the bedrock of any research as it forges a clearer research purpose within a wider setting (Carson, Gilmore, Perry and Gronhaug 2001, 1). Robson (2011) suggests that there are two traditional research alternatives which are known as quantitative and qualitative social research methodology. On one hand, qualitative-oriented

researches have the proclivity to focus on such matters as meanings of issues, people's understandings and interactions, or in general to address the questions of "what", "how" and "why" things occur; on the other hand, quantitative methods tend to emphasis on the importance of data and numerical statistics so as to answer the "what" and "how many" questions (Robson 2011, 223-227; Carson, et al. 2001, 66).

Due to the purpose and explorative nature of this thesis, a mixed methodology of qualitative and quantitative methods is employed: first, the author adapts qualitative methods to analyze in-depth retailers' viewpoint towards Point of Sales Systems (POS) and Uniqul face recognition payment application, then applies quantitative method to dissect end users' attitude and behavioral patterns. According to Robson (2011), this multi-methodology design shall help researchers address different aspects of the research questions, thus provide more complete and comprehensive results to the research. In the context of this thesis, a combination of these two methodologies provides a full-scale panoramic picture to sub-research question **Q3:** *Is there a potential market demand for Uniqul face recognition payment application within the Finnish grocery retailing market?*

Layer 3: Research Strategies: Case Study and Ethnography

Research strategy is essentially a general plan of how the research questions are tackled and how the objectives are met. The most common strategies can be listed as: experiment, survey, case study, action research, grounded theory, ethnography, and archival theory. The choice for an appropriate research strategy depends on various factors yet the most crucial ones are research objectives, research questions, the extent of extant knowledge, time and location constraints, as well as philosophical underpinnings. (Saunders, et al. 2009, 141.)

Within the framework of this thesis, the author decides to utilize simultaneously two strategies: case study and ethnography. Case study, as stated by Yin (2009), projects to answer the "how" and "why" questions. In specific, it provides a rich description, understanding and eventually a

plausible prediction of an entity - be it an individual, animal, household, organization, industry or a nationality (Woodside and Wilson 2003). Ethnography is another research strategy which emphasizes observing and engaging directly inside a “naturally occurring setting”, to eventually study the meaning of this setting, its behaviors and activities from an internal perspective (Brewer 2008, 10).

These two strategies, however, are not utilized in a conventional, mutually exclusive manner, but rather inclusively. This means, ethnography is employed as a part of case study. First the author conducts a case study of the Finnish market, including macroeconomics, industry, retailer and consumer analyses. Then within the consumer analysis section, the author complements case study with ethnographic exploration in order to provide a holistic research result, piecing together elements both of the inner and outer worlds.

Layer 4: Data collection techniques

Data collection techniques is the last layer of the “research onion”, which refers to the process of curating information from respondents and previous studies (Zikmund 2003, 72). The extant techniques are categorized into two sources: primary source – new data that are gathered or observed from “first-hand” experience; and secondary source – data from published summaries or raw data (Saunders, et al. 2009, 256; Barrett 2012). In this thesis, the author uses techniques that generate and retrieve both primary and secondary data. As for the former, data are synthesized from three sources, i.e. semi-structured interviews with grocery retailers in Finland, internet surveys with shoppers in Finland, and ethnography at several stores in Lahti and Helsinki. Meanwhile, regarding the latter, secondary data are fetched from published books, certified reports, academic journals and credible internet sites.

1.4 Ethical Matters

Ethicality refers to the question of how to conduct a research in a moral and responsible manner. In other words, ethicality appertains to the

appropriateness of the researcher's behavior with regards to the rights of the people who are the subjects of the research, or are affected by the research. Ethical matters arises upon virtually every stage of the research, from research proposal, data collection to data analysis and final reporting. (Blumberg, et al. 2005, 91-95; Saunders, et al. 2009, 185-186.)

In the context of this research, the author is confident that ethical issues were barely violated. Primary data collection via face-to-face interview and internet-based survey were conducted in a voluntary and co-operative manner from both sides. Interviews' records and data were sent to interviewees for validation and review before being used for the final thesis. The author consents to certain requirements of information confidentiality and interviewee anonymity from the interviewees as well as survey participants. The sponsoring party (Uniqul Oy) reserves the right to overlook the content of this thesis so as to safeguard the discretion of confidential information. Concerning secondary data collection, the author chooses to collate only legal sources with permission from the authors. Citations and quotations are done in an honest and respectful manner, pertaining to certain standards of Lahti University of Applied Sciences.

1.5 Scope and limitations

This thesis aims to shed light to the research process of market opportunities in Finland for payment processing technology providers, particularly, Uniqul Oy. The scope of this thesis, however is narrowed down to certain boundary. First, the author chooses to only scrutinize the Finnish grocery retailing market, despite the manifold applicability of Uniqul face recognition payment application in other industries. Second, this thesis only reaches to a pre-strategic stage, i.e. it serves as a reference rather than a sufficient document for decision makers to rely on.

Regarding limitations of this study, readers should bear in mind the followings:

First, there exist sporadic data shortcomings throughout the thesis, where certain assumptions and estimations are made as stand-ins. This occurs

by causes of the author's incapability to fully understand several information sources in Finnish as well as the lack of updated data on some Finnish internet sites.

Second, within the framework of this study, a number of matters are either only skimmed through on a brief level (e.g. PESTLE analysis, bargaining power of supplier, threat of substitutes in the Porter's Five Forces model, etc.) or even intentionally left out (e.g. some strategic groups in competitor analysis). This is principally due to time limitations, and hence the author's intention to keep the contents focused.

Third, the reliability of qualitative and quantitative data collection in this thesis is not upheld at an optimal level. The author could only manage to interview two grocery retailers of two separate segments and conduct an internet survey with end users in a relatively short period of time. This was owing to the language barrier, the busy schedule of store managers as well as time constraints that the author encountered during the research.

1.6 Theoretical framework

As this thesis attempts to explore and evaluate the market settings of Finland, the author will employ an array of market analyzing tools, consisting of PESTLE model with modifications, Porter's Five Forces, competitor analysis, and customer analysis. These models are further elaborated through literature reviews in Chapter 2. In auxiliary, internal assessment of Uniqul application will be conducted in Chapter 3 to consolidate the answer to the core research question.

1.7 Thesis structure

This thesis is constructed on two foundations: theoretical basis and empirical research. The structure of this thesis is subsequently delineated in the graph below:

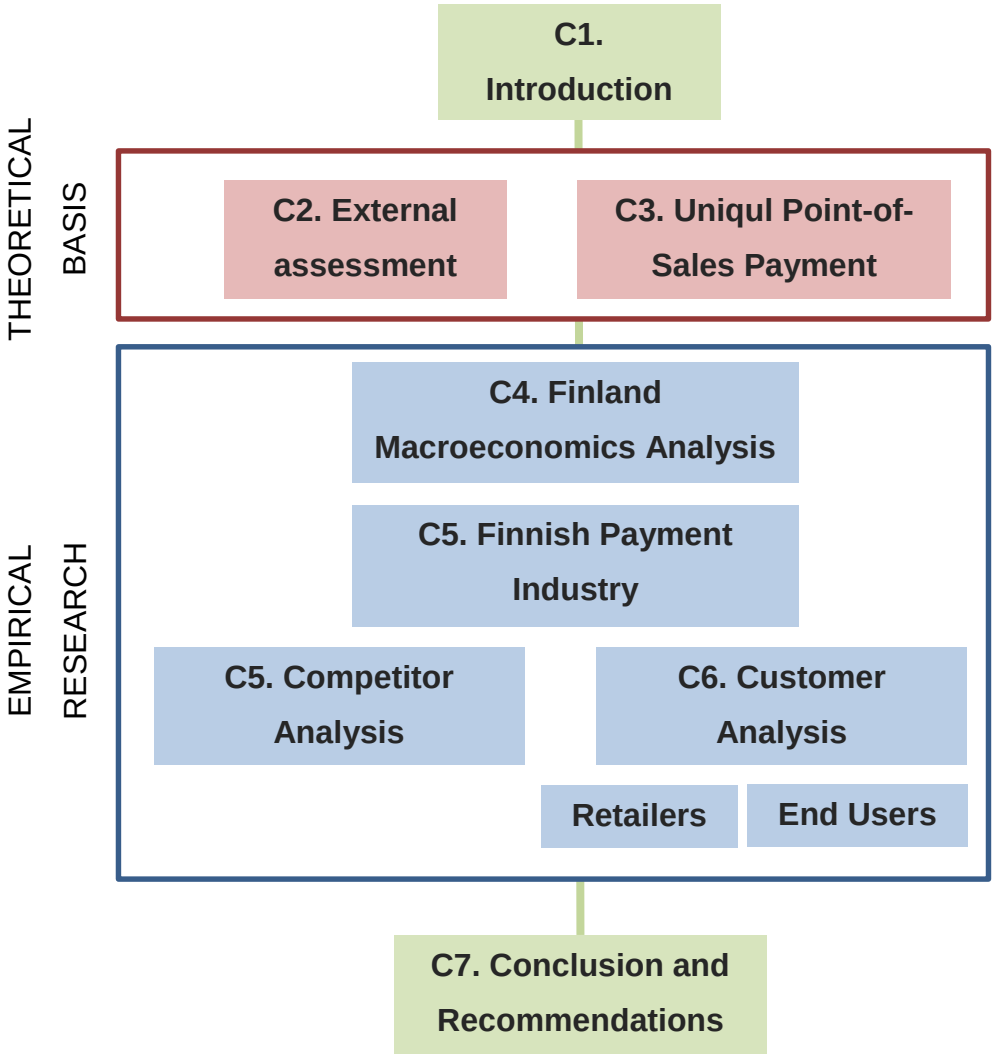


FIGURE 3. Thesis Structure

There are seven chapters encompassed in this thesis:

Chapter 1 sketches out the groundwork of the study, outlining the thesis objectives, questions and methodology as well as other peripheral issues, for instance scope, limitations and structure.

Chapter 2 and **Chapter 3** cover the theoretical basis of this study. Literature reviews on market analyzing tools, i.e. PESTLE model, Porter's Five Forces, competitor analysis, customer analysis are respectively addressed in **Chapter 2**; following by an in-depth study on point of sales payment systems and a brisk overview of Uniqul face recognition payment application in **Chapter 3.**

Chapter 4, Chapter 5, and Chapter 6 erect the empirical research section:

Chapter 4 delineates a macroeconomics analysis of Finland, utilizing the PESTLE model covered in Chapter 2, however with certain modifications that the author shall address in the relevant chapter.

Chapter 5 tackles sub-research question 2: *How intense is the competition in the Finnish payment industry that Uniqul has to face?,* hence an analysis on the Finnish payment industry through Porter's Five Forces model and a more thorough study on current market incumbents/competitors are presented.

Chapter 6 examines the potential customers and users of Uniqul face recognition payment application through data collated via internet survey, interviews and ethnography.

Chapter 7 lays out the conclusion of the thesis while simultaneously proposes recommendations to Uniqul Oy.

2 EXTERNAL ASSESSMENT TOOLS

Chapter 2 investigates the previous studies and empirical results that are relevant to the external assessment tools the author utilizes in the thesis. This encircles PESTLE analysis, Porter's Five Forces, competitor analysis, and consumer analysis. By the end of this chapter, readers are able to answer the question: *What do the environment assessment tools utilized in this thesis essentially mean?*

2.1 Overview

External assessment tools are measures that provide a rich insight and understanding into both remote environment (macroeconomics) and task environment (customers, competitors, channels and suppliers). These discernments contribute expressively to corporate strategy and can potentially be converted into value i.e. profit. (Smith, Raspin and Brian 2008, 25.) Within the scope of this study, the author marginally shies away from the remote environment analysis whilst draws more attention towards immediate task environment elements since they provide a relatively more valuable short-term action insight. Figure 4 elucidates the utilization of the tools:

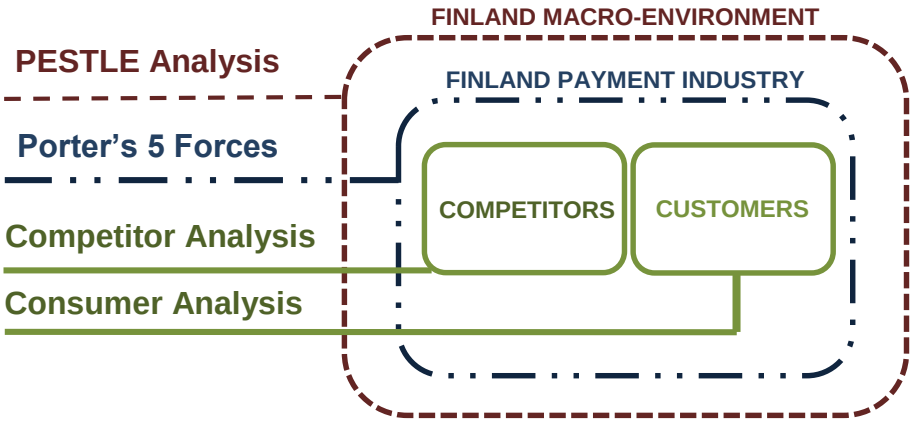


FIGURE 4. Market Assessment Tools

2.2 PESTLE Analysis – Macro-environment analysis

PESTLE analysis is an abbreviation for political, economic, social, technological, legal, and environmental analysis – a strategic planning tool, first coined Francis Aguilar in 1967, to scan the current business environment and to further on identify the direction of change of that environment (Manktelow 2015). Kotler and Armstrong (2014) suggest that those six above-mentioned forces are virtually uncontrollable and are bound to pose both opportunities and threats to any business. Hence a comprehensive understanding and well-adapted strategy to the macro-environment shall help companies circumvent the difficulties, capitalize the chances, and in the long run, survive and prosper. (Kotler and Armstrong 2014, 96-113; Baker 2007, 173-182).

In the following section, the author respectively delves into the theoretical aspect of each factor, so as to provide certain solidification for the upcoming application of this analysis into the context of Finland.

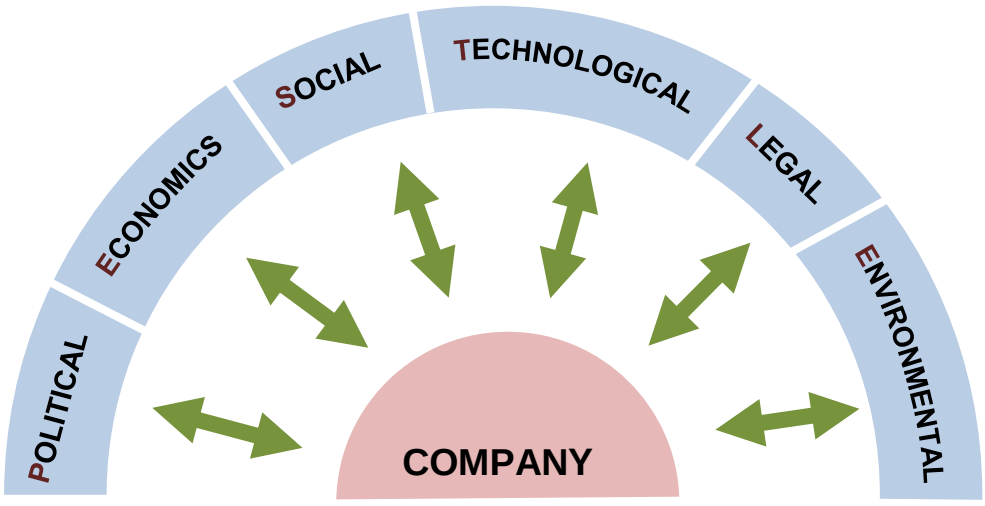


FIGURE 5. PESTLE Analysis (Adapted from Kotler and Amstrong 2014, 96)

a. Political

Political factors indicate those that involve government policies and philosophies as well as political action committees, or also known as pressure groups. In specific, this encompasses of a whole range of issues, spanning from investment policies, direct and indirect taxations, supporting or suppressing regulations to political centricity proposals from pressure groups, for instance, lately as gay rights emphasis. (Kotler and Keller 2009, 126.) Manktelow (2015) compacts the concept above by putting forward some core guiding questions on this political influence:

1. Who are holding/are the most likely contenders for power? What are their views on business policy, and on other policies that affect your organization?

2. How shall the business regulation, along with any planned changes to it, affect your business? Is there a trend towards regulation or deregulation?

3. What is the time scale of the proposed changes?

b. Economic

The economics arena is essentially governed by three dynamics: land, labor and capital. As critical determinants, a disruption to the balance of this trio might emanate serious distortion to the economic system, thus imposing consequences on businesses. (Baker 2007, 173-182.) Within the constraints of a PESTLE-environment-scanning analysis, the distortion of the economic system is, however often relegated to the changes in market competition and purchasing power – the two volatile subdivisions that directly impact companies. In short, the economics factors can be explicated as follows by Manktelow (2015):

1. How stable is the current economy/market? Is it growing, stagnating or declining? - Land

2. What is the current rate and state of unemployment? – Labor

3. Is the disposable income level increasing or declining? Do businesses and individuals have easy access to credit? - Capital

c. Social

"Social factors" is a comprehensive and broad macro-environment fragment, which encircles the majority of aspects of everyday life from social ideologies, norms, cultural values to demographics patterns and lifestyle. (Hollensen 2012, 139-142; Baker 2007, 173-182). From a business belvedere, social factors impose a pervasive and profound sway as they principally define the consumer tastes and preferences, thus determining the market size and altering market demands (Kotler and Keller 2009, 120). In essence, scanning social factors can be translated to answering the subsequent inquiries:

1. What is the current demographic pattern? How is that likely to change?

2. What is the present level of social development?

3. What are the influencing cultural values that effect consumer behavior?

4. What are the relevant social norms that could hinder or benefit the company?

(Adapted from Manktelow 2015; *Usunier and Lee 2009.)*

d. Technological

Technology has currently evolved to be one of the most dramatic macroeconomic forces that, in a narrow sense, reshape people's lifestyle and consuming habits and, in a broader sense, change the economics paradigm (Kotler and Keller 2009, 124; Hunderkar, Appannaiah, Reddy and Ramanath 2010, 51). For businesses, technology inflicts a phenomenal influence since it, as a "creative destruction" force, reformulates the market i.e. supersede the old industries with new ones (Kotler and Keller 2009, 125). Comprehending the technological forces requires responses to the following questions:

1. What are the changes and trends in technology that you could capitalize? How accessible are those?

2. What are the regulations for technology?

3. What is the current status of Research and Development (R&D) landscape – including government and private funding and support?

(Adapted from Manktelow 2015; Kotler and Keller 2009, 125.)

e. Legal

Legal is an inclusive superset that embodies regulations, laws, acts or on the whole, any vehicle of rules of action and conduct stipulated by the government that has binding legal force (Mayer, Warner, Siedel and Lieberman 2012, 8). Business-wise, these legislations serve as means to safeguard business entities from unfair competition, consumers from unfair business practices, and the society from unethical conducts (Kotler and Keller 2009, 126). Kotler and Armstrong (2014) denote that almost every business activity is subject to various sets of legislation, hence detailed understanding of the legal factors can help companies minimalize risks and seize the opportunities. Some guiding questions to scrutinize the legal landscape are proposed below:

> *1. What are the current legislations that affect your business? What are their likely implications on your business?*
>
> *2. What are the newly proposed laws and their action timeframe? Do they unveil any opportunities or hindrances?*
>
> *(Adapted from Kotler and Keller 2009, 126.)*

f. Environmental

Over the past three decades, environmental concerns have been emerging as a major force, exerting impacts on global level, national level and even on microeconomics scale (Kotler and Armstrong 2014, 105). The increasing scarcity of natural resources coupled with the skyrocketing

pollution level have impelled the society, from government to individual consumers, to a search for sustainable solutions and a preference for environment-friendly products (Kardos 2012; Kotler and Armstrong 2014, 105). Kotler and Armstrong (2014), hence suggest that, in today's world, environmentally responsible actions are likely to go hand-in-hand with profitable business outcome – as they help companies exploit government support and to tackle the sensitive point of the changing consumer behavior. The ensuing inquiries provide guidelines to scanning the environment setting:

1. What is the current status of environment in the respective market?

2. What is the prevailing social attitude/norms for environment-related issues? How does the government support sustainable activities?

3. What are other environment factors and trends that might influence your company, specifically the supply chain?

(Adapted from Munoz and Dimov 2014; Kotler and Keller 2009, 122-124; Kotler and Armstrong 2014, 125.)

2.3 Porter's Five Forces – Industry analysis

Porter's Five Forces is a management tool developed by Michael E. Porter, in 1979, with the aim to deliver a novel approach towards industry analyzing process. While the antiquated school views industry analysis as narrow as comprehending the competition between established incumbents, and relies vastly on the SWOT (Strengths-Weaknesses-Opportunities-Threats) framework to size up the environment; Porter's technique offers a more solidified and systematic method to understand the long-run dynamics of the industry. (Magretta 2012, 35-45.) It tackles the issue from an outside-in perspective, inspecting from the very core of an industry: the structure i.e. how the economic value created by the industry is distributed (Porter 2004, 3-5). Porter (2004) intimates that the gist of competition is not to trounce the rivals, but rather to gain profits; hence scrutinizing the industry should involve multiple other players – the

"competitors" who attempt to capture the value that the industry creates. He reveals the five combatants who intensify the industry competitiveness and are engaged in the war to seize the industry's profitability:

1. New entrants: The ones who seek to enter and gain the market share

2. Suppliers: The ones who want to get paid more and deliver less

3. Buyers: The ones who want to get delivered more and pay less

4. Substitutes: The industry outsiders who want to snatch away the industry's profitability

5. Rivals: The industry insiders who want more market share and profitability

(Magretta 2012, 35-63).

These competitive forces are diagrammed as in the figure below:

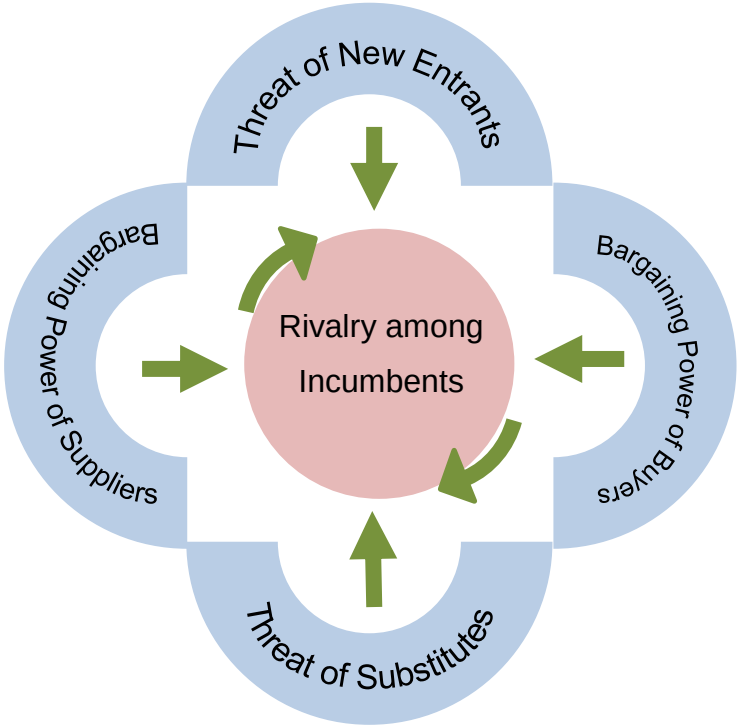


FIGURE 6. Porter's Five Forces (Adapted from Porter 2008)

Porter's Five Forces model's application is among the kernels of this thesis as it, aside from answering the question "how competitive is the market?",

provides a structural comprehension about the very contiguous environment of a company, thus helps the company visualize its positioning of in the industry, identify the prospective opportunities or threats, and eventually formulate the strategic decision of to enter or to diversify from the industry. In the ensuing section, the author will dissect each of the factors for a keener insight, however with additional accentuation being placed on threats of new entrants, bargaining power of buyers and threats of competitors as for their vital relevance to the impending application within the empirical part.

a. Threat of New Entrants

New entrants are defined as firms who have recently entered or threaten to enter the industry, mainly because of the attractiveness of superior profitability that the incumbents have attained (Barney and Hesterly 2008, 41). This force adds capacity to the industry, thus lowers the profitability, whilst concurrently aggravates the competition (Porter 2004, 32).

The threat of new entrants is determined by present barriers of entry and the anticipated retaliation from the extant contenders (Porter 2008). Regarding the prior, Porter (1998) points out six foremost hurdles that are likely to dilute the attractiveness of the industry towards newcomers:

1. *Economies of scale*: the cost advantage that large-scale entrenched contenders have, be it in fields of purchasing, manufacturing, marketing, researching, sales or distribution, etc., against small-scale new entrants.

2. *Capital investment:* the required financial resources and corresponding risks to enter the business, which is calculated based not only on fixed assets but also on unrecoverable advertising fees, R&D, inventories and other incurred and additional expenses.

3. *Distribution channel:* the availability of distribution channels to the industry.

4. *Inimitable advantages:* The vantage points of some existing companies that cannot be mirrored, for instance effects of learning curve, proprietary technology, access to superior materials, favorable geographical positions, etc.

5. *Product differentiation:* The brand identification and customer loyalty of incumbents, attained from the accumulation of previous marketing and customer service efforts.

6. *Government policy:* Government interventions to adjust the availability of the product or service to consumers, thus expand or limit the size of the industry. These are implemented via enactment of license requirements, regulations, subsidiaries, taxes, tariffs or more subtle, controls over resources, pollution standards and emission limits.

(Porter 1998; Barney and Hesterly 2008, 41-42.)

Projected retaliation acts from existing contenders are also a factor that impedes newcomers from entering the industry. If the industry is stagnant or depreciating in profitability, and the established contenders have substantial resources to commence retribution, then there is high likelihood that new entrants shall be assailed or faced with significant difficulties in inauguration. (Porter 1998.)

In short, the likelihood of newcomers to the industry is low if there exist high economics of scale, massive initial capital requirements, unavailable or occupied distribution channels, abundance of companies with inimitable advantages and product differentiation, along with tight government policy and intense retaliation conducts from incumbents; and vice versa.

b. Bargaining power of suppliers

Suppliers are positioned at the head of a supply chain, comprising all those who provide inputs that go into a product or service (Magretta 2012, 45). Powerful suppliers hold the ability to “squeeze out” as much profitability as possible from the industry by increasing price and/or reducing quality or quantity (Porter 2004). Porter (2004) suggests that

suppliers with high bargaining power pertain to five indicators: first, they are more concentrated than the industry they supply to; second, they offer unique or distinguished values; third, they are not threatened by substitutes; fourth, they own the ability to integrate forward into the industry they are supplying to; last, they are a crucial part of their buyers' business, yet the inverse arrow does not apply.

c. Bargaining power of buyers

Buyers, on the flip side, are the recipients of products or services from the industry, thus stand at the tail section of the supply chain (Lysons and Farrington 2012, 90). Porter (2004) posits the view that powerful buyers who are capable of forcing the prices down along with demanding more quantity and quality of the products, are likely to be sprouted from a circumstance in which:

1. *Buyers are more concentrated in comparison to sellers and have high purchase volume relative to seller's sales:* Bulk buyers are of essential importance to sellers, specifically to the ones with high fixed cost and low variable cost, as they do not only provide a mainstream revenue, but also ensure the capacity to cover the overhead fixed costs. Therefore, these buyers can exert their clouts manipulate the sales price.

2. *Products purchased from the industry account for a significant fraction in the buyer's budget:* As the products that buyers intend to purchase from the industry take up a considerable segment in their cost structure, buyers rationally become more price sensitive, hence are prone to search for favorable conditions and purchase more prudently.

3. *Products offered by the industry are standardized with minimal differentiation:* If all sellers offer the same value, buyers can certainly consider among several alternatives. This insidiously pressurizes suppliers to either lower the price or increase the quantity in order to appeal sales.

4. *Buyers earn low profit margin:* Queensland government (2014) postulates that increasing profit can be done by reducing direct costs;

therefore low profit earners are extensively incented to negotiate the purchasing cost down.

5. *Buyers possess the capability to integrate backward to render the services or manufacture the products they are purchasing:* This competency elevates the buyers to a position with higher bargaining leverage as it poses a credible twofold threat to the suppliers if they deny to concede: on one hand they lose sales, while on the other hand they instigate a new competitor to enter the industry.

6. *Buyers are exposed to full source of information:* Abundant information about actual market prices, suppliers' costs and other augmented data gives buyers an edge in evaluating the sellers' offers and consequently acquiring the most beneficial deal.

7. *Buyers have no or minimal switching costs:* Switching costs refer to the cumulative expenses that incurred when buyers switch suppliers. This impediment encloses a whole range of outlays from employee retraining, testing to technical supervising and redesigning. Buyers who are exempted from these costs, are hence more powerful as they do not encounter any hurdle in considering the switch.

(Porter 2004, 33; Magretta 2012.)

d. Threats of substitutes

Substitutes refer to the cluster of products and services that perform the same function or offer the same value as the product or service of the industry (Porter 2004, 33). The emergence of these alternatives puts a lid to the price that the industry can charge before customers switch to purchase the substitute products; this therefore decreases the bonanza the industry can prospectively reap and provokes a stiffer competition inside the industry (David 2013, 107). Powerful substitutes who can suppress the price ceiling to an as low as possible level, are characterized as those with superior offers, lower price and operate in an environment where the buyers have marginal switching costs (Porter 2008).

e. Rivalry among incumbents

Rivalry among incumbents is allotted at the epicenter of Porter's model since it is indubitably the most dominant and directly influential force when analyzing the structure and evaluating the attractiveness of the industry (David 2013, 107). This competition takes various forms from acute advertising campaigns, customer services ameliorations, introductions of new products and augmented values, to the extreme of intense price competition – the point which could potentially wear off the industry profitability (Porter 2004, 33). Porter (2008) states that there are some critical attributes of the industry that are likely to generate intense rivalry:

1. *Slack industry growth:* When the industry witnesses stagnation, the competition is eventually translated to a market share dividing game, i.e. if companies seek to gain more sales, they shall have to snatch them from other entrenched incumbents, rather than the void alternative of keeping up with the growth of the industry. This intensifies the rivalry. (Barney and Hesterly 2008, 43.)

2. *Large number of equally-balanced contenders:* In the scenario that incumbents are relatively the same size and possess the same power, industry battles have higher possibilities to be sparked and elongated, since all combatants own comparatively equivalent resources to sustain their retaliation acts.

3. *Significant capacity requirement:* If the industry includes companies with high fixed cost or those that desire economies of scale, it might be a volatile subject for stiff competition due to the preset sales capacity that has to be filled to cover the overheads or to achieve the cost advantage of economies of scale.

4. *High exit barriers:* Exit barriers are defined stumbling blocks that deter the companies from leaving the industry even in the situation that profitability runs low or negative. These barriers might owe to specialized assets with low liquidation, significant resettlement costs, government exit restrictions or emotional reasons. When the exiting lane is impeded with

huge boulders, incumbents, especially the ones with low gains, tend to compete fervently to stay in the industry with extreme measures that might hurt the industry profitability.

5. *Buyers have no or marginal switching costs:* This factor bears the same implication as in “Threats of substitutes” section.

6. *Lack of product differentiation:* Barney and Hesterly (2008) claim that when differentiation is an out-of-the-question strategy, companies often resort to pricing to induce sales and gain market share. As a result, price competition surfaces and is exacerbated.

2.4 Competitor analysis

Competitor analysis, as suggested by Baker (2007), is a detailed and systematic assessment documentation about existing and prospective contenders. This keen understanding about who you are engaged with represents a cornerstone of corporate success as it contributes principally to managerial planning and decision making (Wilson 1994, 24).

The process of analyzing competitors is, however quite sophisticated as it critically requires considerable investment to collate credible data and construct what is called “competitor intelligence” – an information repository that assists the company in comprehending, counteracting and anticipating its opponents’ moves (A.Hitt, Ireland and E.Hoskisson 2005, 63-66). Porter (2004) provides a solidification to this matter by proposing a framework for competitor analysis that consists of two phases:

a. Identifying competitors

This phase essentially answer the question: *Against whom the company is battling with?* (Wilson 1994, 25).

As much simple as the answer might seem, the actual periphery of competitors that the company has to face can be more extensive than the first thoughts. Broadly from a market viewpoint, competitors can be defined as firms who are and will compete for the same goldmine of

customer spending power, hence apart from the obvious direct combatants, indirect and potential ones should also be taken into account. (Wilson 1994, 25; Porter 2004).

Aaker (2013) proposes a couple of approaches to pinpoint the right existing direct and indirect competitors:

1. *Customer-based approach:* This method centers the idea to identify contenders from the perspective of customers – paraphrasing in a penny plain way, it detects contenders by gather customers' answers to the question: What are the choices do you have to satisfy your need?

2. *Strategic group approach:* This method tackles the matter by categorizing competitors in strategic groups based on their competitive strategy. This means, the company formulates groups according to certain criteria, for instant: having similar strategies (pricing, marketing, and distribution), similar size, similar competencies, etc.; then identify competitors within those clusters.

Regarding the segment of potential competitors, Porter (2004) suggests that the company should conduct a systematic forecast of potential engagers to competition, whom he speculates could derive from four possibilities: (1) firms with ample resources to easily surmount the entry barriers, (2) customers or suppliers who integrate backwards or forwards, (3) firms who have apparent intention to penetrate the industry, (4) firms who achieve obvious synergy by being in the industry.

b. Analyzing the competitors

Once having acknowledged who settles down around the table, the next phase involves scrutinizing the players before the poker game. This step fundamentally helps the company build up a competitor response profile, i.e. provide answers to four main questions:

1. What are the probable moves and strategic shifts of the competitor in the future?

2. What are the defensive capability and retaliation acts of the competitor in the event of industry and environment changes?

3. How serious are the actions?

4. Within which segments or strategic dimensions will the actions occur?

Porter (2004) and Aaker (2013) both moot their model vis-à-vis competitor analysis with differing components, yet converge on the rudimentary rationale. This thesis employs a consolidation of the two methods:

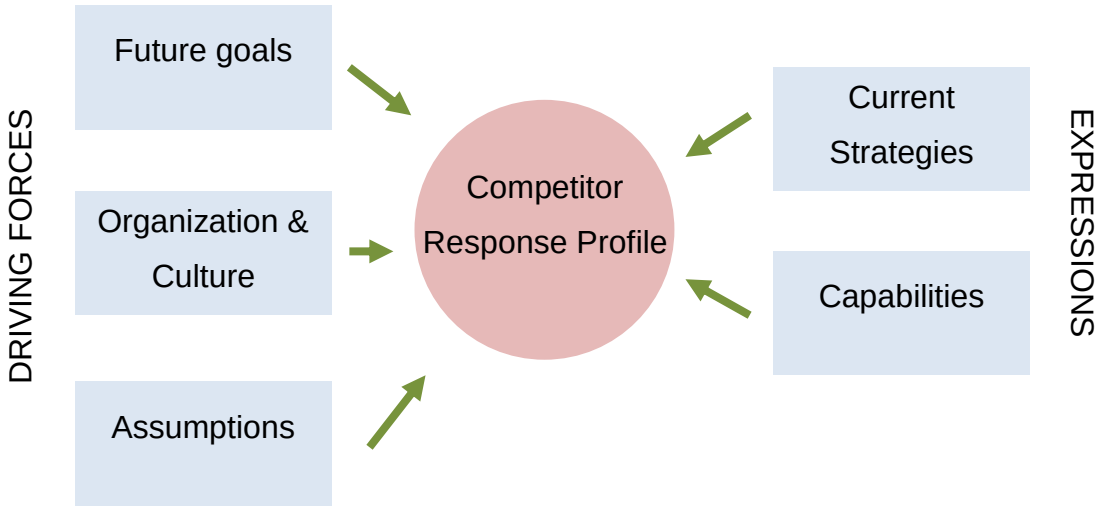


FIGURE 7. Competitor Analysis Model (Adapted from Porter 2004; Aaker 2013)

1. *Future goals:* Future goals identification refers to a comprehensive investigation of competitor's both mid-short term objectives and long term goals, at all management levels and on all aspects (Porter 2004, 50). Nonetheless, due to the shortage of research time and data, the author only attempts to dwell on some imperative sub-dimensions:

a. Business unit financial goals: this aspect diagnoses competitor's expected profitability, market share, rate of growth, the desired level of corresponding risks along with the their timeframes, which answer the question: "Is there an emphasis on short-term or long-term profits?"

b. Business unit noneconomic commitments: this aspect puts concern on other augmented values that the competitor projects to attain, such as being the technology pioneer, environment maverick or the location leader.

c. Corporate parent business goals: If the competitor belongs to a larger parent company, additional study on the holding company is of crucial importance as this entity is prone to impose significant influence, mission and vision-wise on the competitor. Porter (2004) specifies three guiding questions in relation to this issue:

- What is the current status of the parent? – This question aims to retrieve information on the rate of return, growth level and market position of the holding company as these parameters may be indirectly translated into the goals of the subsidiary.

- What are the economic and noneconomic goals of the parent company?

- What is the strategic position of the business unit in the corporate portfolio? – This query scrutinizes the importance of the competitor in the eyes of its parent company, more specifically it seeks to acknowledge whether the competitor is among the core business or secondary focus of the holding entity; if it is expected to be a future growth segment (raising star), a mature and stable source of revenue (cash cow) or a subject for divestiture (dog); if there are any economic relationships and emotional attachments between the business and the parent company or other subsidiaries, and what their implications are.

(Porter 2004.)

2. *Organization & Culture:* This factor holds a pervasive imprint on competitor's demeanors, hence understanding the interior structure of how the contender organizes itself can provide a great deal of clue to envisage its probable strategy (Aaker 2013). According to Porter (2004) and Bradley (2002), there are two key issues that need to be taken into consideration when it comes to organizational and corporate-cultural dimensions:

a. Who are the decision-makers of the competitor? – The composition of the board, together with their backgrounds and experience can partially reflect the competitor strategic approaches.

b. What are the current orientation and incentive systems? – In essence, this question attempts to harness data on how different-department staffs are compensated, what kinds of performance are regularly rated or appreciated, what kind of structure is being employed – flat or hierarchical, and how intense is the control, to gauge what the competitor value the most.

3. *Assumptions*: Alike players on a poker table, the majority of businesses operate on a certain extent of assumptions, about itself and about the industry and other firms in it. Owning even a brisk insight into the assumptions of the competitor can uplift the company to a vantage point to anticipate the competitor behavior and conducts as well as to gain leverage from the competitor's biases or fallacious "blind spots" (Porter 2004).

The study of competitor assumptions, nevertheless happens to be of great complexity as it demands a foolproof and logical process, conjoined with reliable data. Hence within the framework of this thesis, the author selectively tackles the most significant one out of eight Porter's guiding questions:

How does the competitor observe the industry and incumbents, the future demands and trends?

(Adapted from Porter 2004.)

4. *Current strategies:* The fourth component of competitor analysis principally addresses the question: *"What has the competitor been doing?"* (Porter 2004, 56). It allegedly provides a pragmatic reflection of competitor, hence could be treated as a worthy indicator for the competitor's forthcoming conducts.

The course of analyzing the competitor's strategy, as Porter (2004) asserts, is encyclopedic as it requires both a breadth study on the relevant functional areas and an in-depth identification of the explicit (planning) and implicit (implementing) strategies. Figure 8 depicts the "Wheel of Competitive Strategy", which includes the key aspects that need to be taken into account when examining the competitor's strategies:

FIGURE 8. Wheel of Competitive Strategy (Porter 2004, 56)

5. *Capabilities:* Evaluating the strengths and weaknesses of the competitor supports the company in determining the ability and intensity of the competitor to initiate or countermove a strategic stroke (Porter 2004). Porter (2004) recommends a qualitative way of assessing the capabilities by scanning through key dimensions of a business from production, distribution, marketing, finance, and R&D to operation, organization, and management. Aaker (2013) complements the idea with a more insightful quantitative approach by formulating the critical success factors table. This method, in auxiliary to what Porter's technique does, numerically tallies the strengths and weaknesses of the competitors.

Aaker's method encompasses of three main steps:

a. Identify the relevant assets and competencies that are vital to get ahead in the industry

b. Tabulate a competitive grid that contains the above factors and assign a weight to each of them according to their relative importance to achieving success in the industry.

c. Qualitatively appraise the competitors in alignment with each factor to conclusively draw out the competitors' strength and weaknesses.

(Adapted from Aaker 2013.)

2.5 Customer analysis

Customer analysis, despite being allocated at the rear of this external environment assessment, stands to be the most salient undertaking in studying the marketplace. It provides businesses with a holistic picture and understanding about the processes of selecting, purchasing, using or disposing of products and services of their customers – the entities that directly generate revenues (Solomon, Bamossy, Askegaard and Hogg 2010, 3-5). The process of analyzing customers and discerning their behaviors, as indicated by Solomon et al. (2010) and Armstrong and Kotler (2007), is irrefutably intricate since it deals with what happens in human mind, thus entangles different disciplines, streaming from macro-level of cultural anthropology and demographic to microeconomics and individual psychology.

In the context of this thesis, customer analysis is designated primarily to answer sub-question **Q3.** "Is there a potential market demand for Uniqul face recognition payment application within the Finnish grocery retailing market?" and secondarily, to provide a tentative estimation of that demand. The nature of these objectives and of Uniqul application broadens the scope of customer analysis to not only direct buyers of Uniqul (retailers) but also to its end users (consumers), yet hems the depth of analysis in to merely a brisk examination of unmet needs and motivations of customer segments in order to gauge potential demands.

Figure 9 encapsulates the facets of customer behavior that the author will dig in.

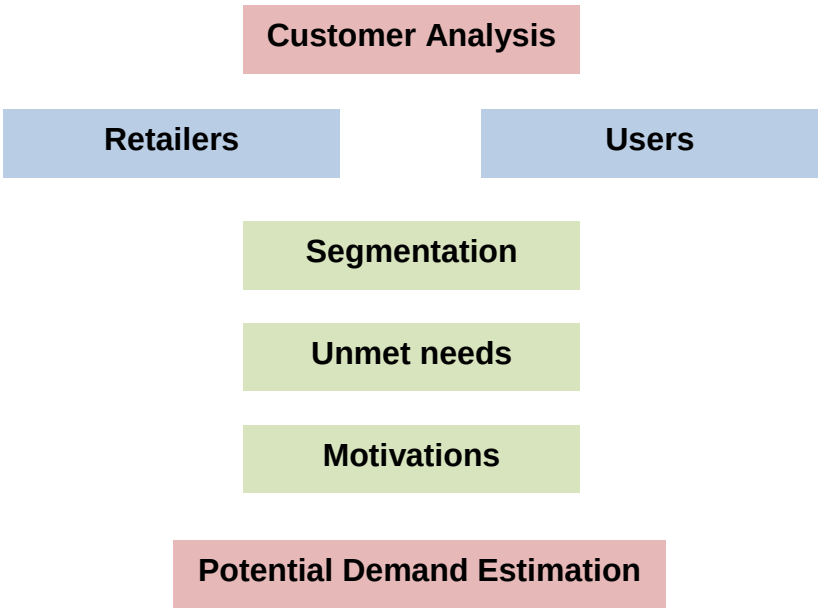


FIGURE 9. Customer Analysis Outline (Adapted from Aaker 2013)

a. Segmentation

Market segmentation refers to the process of splitting customers or potential customers in a market into groups with homogenous characteristics (Fahy and Jobber 2012, 58). Through this operation, the company can get a more elaborate and specific grasp of the values its customers are seeking for along with the motivations that drive their choices , henceforth tailors its offerings more effectively and efficiently to match the distinguishing needs of each segment (Armstrong and Kotler 2007; McDonald and Dunbar 2010, 15).

There are manifold ways to divide up a market, however Hutt and Speh (2007) limit them down by noting that an effective segmentation should be strategically justifying – i.e. the segments created must be measurable (possible to obtain the size and characteristics), accessible (possible to be effectively reached and focused), sustainable (large and profitable enough to be focused on), compatible (suitable with the firm's resources and

capabilities), and responsible (reacts distinguishingly from each other). Table 1 illustrates the feasible segmentation approaches for this study:

TABLE 1. Market Segmentation Approaches (Adapted from Aaker 2013)

	Retailers	**Users**
Customer Characteristics	• Geographic • Size of firm • Type of firm	• Geographic • Demographic: • Age, Gender, Income, Sex, Occupation, Family Size • Psychographic: Tech-savvy
Product-related	• Benefits Wanted • Price sensitivity • Usage	• Benefits Wanted • Price Sensitivity • Usage

b. Unmet needs and motivations

After segmenting the market, unmet needs and motivations of each customer group are studied as a basis to anticipate the expanse of future demands.

- What are unmet needs and motivations?

Need is defined by Kotler and Armstrong (2014) as the “state of felt deprivation”. Maslow (2000) complements on this concept by categorizing human needs into five core groups, which are ordered in a hierarchy of prepotency: physiological (the utmost need to maintain the normal state of the body e.g. hunger, thirst), safety (the need to be secured from wild animals, temperature extremes, criminals, assaults and murders, etc.),

social (the need to be loved and to belong), esteem (the need to be stably and firmly recognized and usually, highly evaluated), and self-actualization (the need to be constantly content and satisfied with oneself).

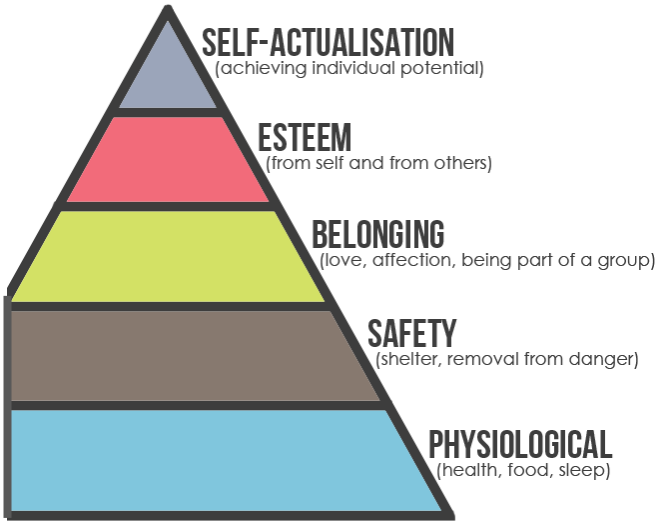


FIGURE 10. Maslow Hierarchy of Needs (Adapted from Maslow 2000)

Unmet needs are customer needs that have not been gratified by extant products or services. They play a salient role in corporate strategy since capturing these unmet needs is virtually synonymous to seizing the opportunities to increase the company's market share and gain more revenue. (Aaker 2013.)

Motivation, from a psychological perspective, can be thought as an evolution of a need, with sufficient level of intensity to drive customers to seek fulfilment (Armstrong and Kotler 2007). Due to its forthright impact on purchasing decision of customers, and thus on potential demand, further elucidation of what motivation intrinsically comprises is of significant necessity.

Maslow (2000) theorizes that motivation varies pertaining to the hierarchy of needs. This means that people are inclined to be dominantly motivated by their most prepotent needs whilst forgo the less important ones; for instance, a man with dire thirst will seek for some water to quench his dehydration and take no interest in being highly appreciated by the society

at that certain point (Maslow 2000, 251-254). Ott (2010) offers a particularization to Maslow's idea by proposing eight most weighty triggers for purchasing decision:

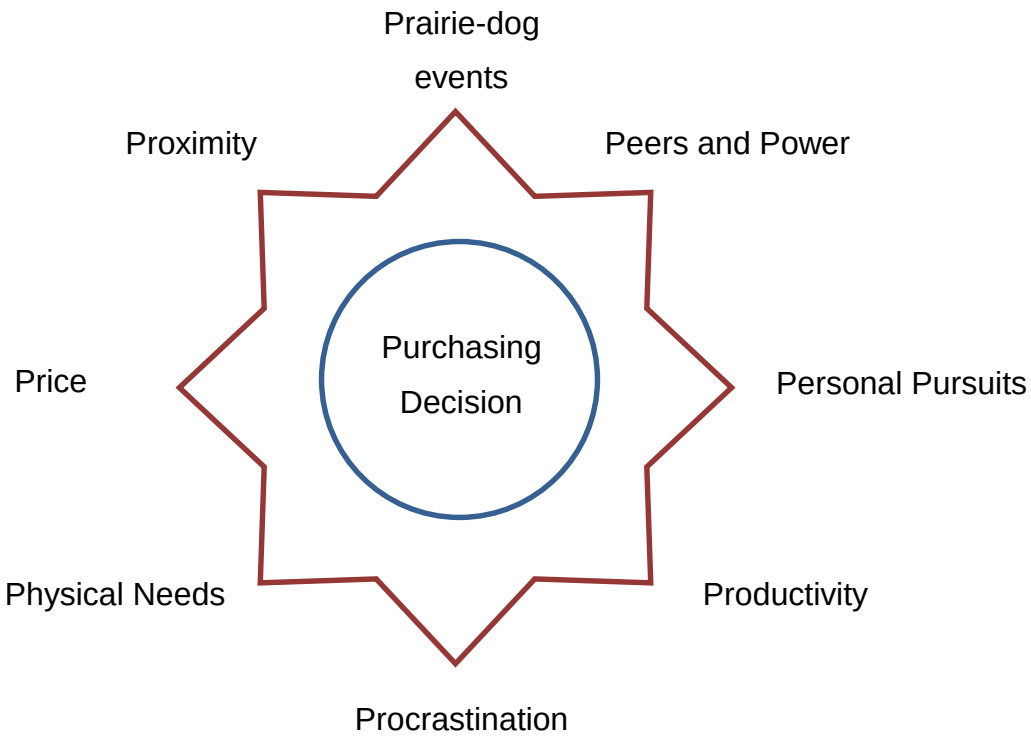


FIGURE 11. 8Ps Triggers Model (Adapted from Ott 2010)

- Prairie-dog events refer to the events when problems set in and customers are triggered to look around for solutions: when the laptop processing speed deteriorates, users are prompted to look for a new laptop.
- Peers and power indicate the motivations created by the social subjects namely family, friends and other close groups: when all friends own an iPhone 6s, people are provoked to purchase one.
- Personal pursuits encompass of internal needs, be it a hobby or an objective: when a person have an interest of collecting stamps, it is highly likely that he will purchase a new design.
- Productivity refers to the fact that customers have the proclivity to purchase products or services that enhance their productivity.

- Procrastination indicates the trigger of purchasing that arises when customers are about to reach a deadline.
- Physical needs indicate the motivation that emanates from either survival instinct or body requirements.
- Proximity refers to the driver of purchase that emerges while customers are nearby the product: when customers queue in line before the counter at the supermarket, they are greatly incited to grab a Snickers bar on the shelf adjoining the counter.
- Price indicates the purchasing trigger when customers come across a low-price product or a substantial discount.

(Adapted from Ott 2010.)

Ott (2010) additionally denotes that the eight triggers do not bear an equal force since they are vastly dependent on the circumstance and their relative importance as in Maslow's model.

To the same context of motivation, Herzberg (1966) supplements that aside from triggers that push customers to action, which he refers to as "satisfiers", purchasing decision is simultaneously affected by "dissatisfiers" – i.e. factors that impede customers from buying. A closed sale means the aggregate satisfiers have outweighed the dissatisfiers. Herzberg's theory, hence implies that gauging potential demand should be conducted on the groundwork of assessing both what motivates and what demotivates customers. (Kotler, Keller, Kevin Brady, Goodman, and Hansen 2009.)

- How to identify customer unmet needs and motivations?

Getting hold of customer unmet needs and motivations is no simple task as for the fact that customers are not always able to articulate their specific needs, especially those that relate to high technology (Mohr, Sengupta and Slater 2010, 190). There have been several measures proposed to overcome this hurdle, however in this study, the author shall only employ the two-fold approach suggested by Aaker:

1. Voice-of-customer surveys and interviews: Aaker (2013) argues that customers, as obvious as it might seem, are a prime source of information to detect and understand unmet needs and motivations. The key to elicit these data is, therefore to get into the customers' mind with well-tailored questions to aid them clarify their existing problems as well as their unaware needs and triggers. Some recommended questions are:

- *What are customers dissatisfied about? Why?*
- *What is the severity of the issues?*
- *What are the unmet needs that customer can identify? Are there any that customers are unaware of?*
- *What elements of the product do customers value the most?*
- *Why are they interested in buying the product?*
- *What are their prioritized motivation?*

(Adapted from Aaker 2013.)

2. Ethnography: is essentially a "follow-me-home" approach that reinforces the reliability of the above surveys and interviews method (Sauro 2014). It offers a complementary insight of "what customers do" to the extant knowledge of "what customer say". In other words, it aims to garner a deeper understanding of customer needs and motivations through empathic observations of the user's world, rather than just from user's articulations. (Mohr, Sengupta and Slater 2010, 196-197.)
Aaker (2013) intimates that these observations should be done in as many normal contexts as possible so as to exploit:

- *The unarticulated problems customers encounter that mist their needs*
- *The circumstances that motivate customers to use the products*
- *The unarticulated importance of intangible attributes*

(Adapted from Mohr, Sengupta and Slater 2010, 196.)

c. Potential demand estimation

This is the conclusive section of the customer analysis framework, in which the identified customer unmet needs and motivations will be utilized to determine whether or not there exists a demand for the product or service. The author, in auxiliary, also projects to estimate the rough amount of this demand during deployment phase.

How to forecast the rough amount of demand prelaunch?

Gauging demand prelaunch, especially for breakthrough innovations like Uniqul, is comparatively more complex and erroneous than conventional forecasting due to the lack of historical sales data and customer's commitment biases towards current technology. Frank Bass offsets these drawbacks by suggesting the Bass Model to provide a more credible estimation of the amount of demand prelaunch. (Mohr, Sengupta and Slater 2010.)

Bass model is a forecasting technique conducted prior to product commencement – i.e. in the circumstance where there is barely no availability of any preliminary sales figures. The model operates on the idea of the S-shaped curve in the "Diffusion theory of innovations" by Everett Rogers. (Mohr, Sengupta and Slater 2010, 217)

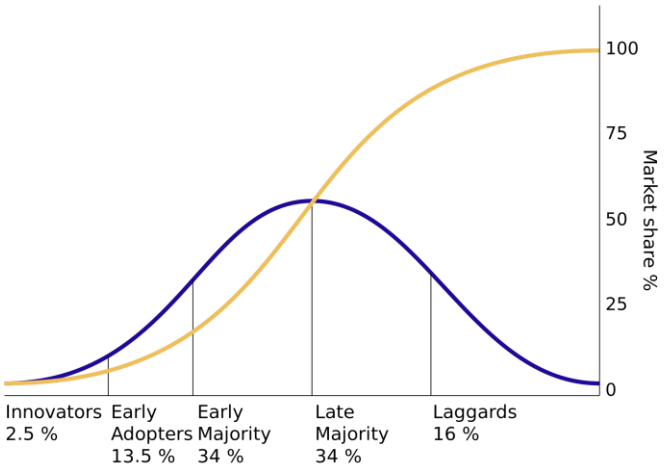


FIGURE 12. S-shaped Curve - Diffusion Theory of Innovation (Adapted from Rogers 1983)

The S-shaped curve illustrates the cumulative market penetration rate of an innovation over time. It stems from the kernel idea of Rogers's diffusion theory, which states that: (1) when a new advancement is introduced, as few as 2.5% of the entire population – the brave souls who are risk-taking and technology-enthusiastic – are willing to adopt the product, since most other people are still skeptical; (2) after that, these so-called "innovators" spread the experience to a larger population of "early adopters" – the people who often are opinion leaders and are interested in making real use of these innovations to gain competitive advantages or boost productivity – hence raise the penetration rate by around 12.5%; (3) at the next stage, the increasing "early adopters" endorsements of the product bridge the extant "chasm" of suspicion, thus incite more people – the "early majority" – to purchase and upsurge the rate of adoption by 34%; (4) this mass further on pervades the usage of the innovation to the next 34% of "late majority" before reaching the last 16% "laggards" – the conservative individuals who purchase the product only in imperative circumstances (Rogers 1983).

Bass model, on the groundwork of the S-shaped curve and the "Diffusion theory of innovations", augments that the adoption of the innovation permeates majorly through two channels of communication: mass media and interpersonal communication. Therefore, the potential amount of adopters can be approximately calculated based on the force of these two channels, as in the formula below:

$$N(t) = m \cdot \left(\frac{1 - e^{-(p+q)\cdot(t-t_0)}}{1 + \frac{q}{p} e^{-(p+q)\cdot(t-t_0)}} \right)$$

In which:

N (t): is the number of adopters at time t
m: is the market potential

p: is the “coefficient of innovation” – the force of mass media channel, or simply the likelihood that somebody starts using the product because of mass media influence.
q: is the “coefficient of imitation” – the force of word of mouth, or simply the likelihood that somebody purchases the product because of the impact of others who have been using it.

The coefficients of innovation and of imitation utilized in the above formula can be estimated either from analogous data of similar products or from industry mean values. (Bass 1969; 215-227.)

3 UNIQUL POINT-OF-SALES PAYMENT APPLICATION

As a continuation of Chapter 2, Chapter 3 solidifies the answer to the key research question by providing a brisk internal evaluation of Uniqul point-of-sales payment application. To better explicate the subject, this chapter is broken down into two sub-chapters:

Sub-chapter 3.1: General overview of point-of-sales payment system

Sub-chapter 3.2: Synopsis and assessment of Uniqul face recognition payment application

By the end of this chapter, readers are able to marginally comprehend the novel idea of Uniqul face recognition payment as well as its strengths and weaknesses.

3.1 General overview of point-of-sales payment system

Definition:

Point-of-sales payment system, commonly abbreviated as POS system, indicates the bundle of devices that brick-and-mortar retailers use to conduct sales and track transactions at the location where procurements occur (Hayes 2012). More simply speaking, it encompasses the apparatus that typically appears at a checkout counter or a cashier stand, for example: cash register, barcode scanner, receipt printer, payment processor, etc. (Owens 2015).

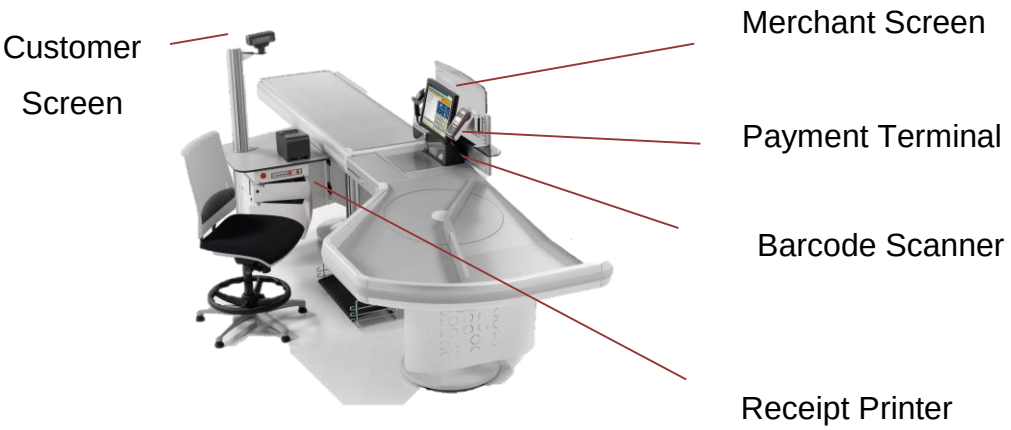


FIGURE 13. A Typical Point-of-sales Payment System (Adapted from Foxbarn 2015)

Impacts:

POS system, though trivial and procedural as it might seem, in fact exerts a massive influence onto retailers:

On the façade, a properly deployed POS system can directly lead to higher sales. According to data collated by Dion (2003), a POS system can optimize sales up to 20% at peak performance and around 5% at trough. This is attained through the capability of the POS system to sway check-out rate as it is the key determinant to how fast customers can proceed with their purchase and hence how much revenue is accumulated. The acceleration of checking out occurs majorly at two sections of the POS system: product identification (the speed and accuracy that items are scanned) and payment implementation (the speed of authorization and transaction). (Dion 2003.)

On the hull, POS system can suppress expenses through the regulation of human resource. An efficient system is able to help retailers reduce redundant staff positions, which, especially for small and medium-sized businesses, can represent a significant proportion in the overall fixed costs. (Dion 2003.)

Hind-side, a POS system with updated add-ons is capable of impacting several other operations of a retailer, hence can ultimately up-surge the aggregate profitability; for instance:

- Merchandise functionality embedded in the POS system can synchronize with inventory and warehousing operations to aid retailers ensure a decent level of inventory and proper mix of stocks: by alerting reorders when stock level is low, reconciling inventory balance with current customer demand, and notifying stagnant or outdated stocks that need to be handled.
- Customer profiling functionality can facilitate marketing and sales activities by providing a rich customer database of buying behaviors and trends. These statistics can be exploited to tailor apt customer relationship management strategy (e.g. loyalty programs) for centric customers, or ameliorate sales conducts and shelf placement design in consonance with buying behaviors to obtain optimal sales volume. (Dion 2003; Balter 2015.)

Advancements:

Ever since the birth of its prototype – the cash register in late 1800s, POS system has witnessed a gigantic revolution both in backend and frontend developments (Revel System - The Ipad Point of Sale Solution 2015). However, in this very section of the thesis, the author shall only meddle with evolutions of the frontend aspect i.e. those are related to payment processing, as for their utter relevance to Uniqul face recognition payment application.

The most prevalent and basic method of payment processing is via a plastic card (credit and debit cards) processor - the method that accounts for almost 51% of total in-store consumer transaction volume (Hitachi Consulting and BAI 2010, 139-142).

FIGURE 14. A Plastic Card Processor Terminal (Verifone 2015a)

Plastic card processing for retailers is often handled by a third-party provider and is subjected to a standardized operating sequence of eight steps, which involves six main parties: consumer, merchant, processor, acquirer, payment scheme and issuer.

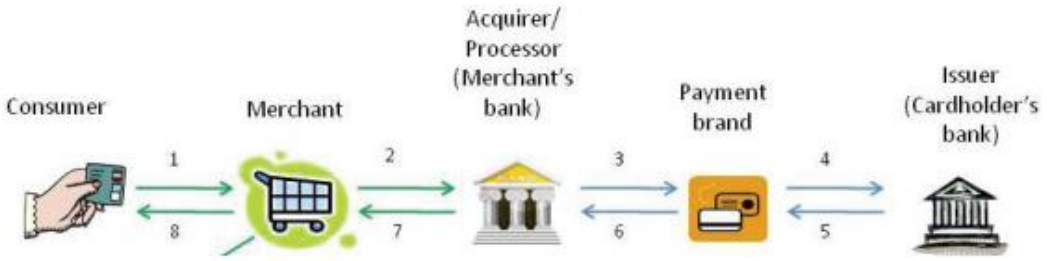


FIGURE 15. Simplified Plastic Card Transaction Flow (First Data 2010)

In the first phase, consumer inputs his payment card along with any required authorization code (e.g. PIN code) into a secure card terminal at the merchant's point of sales. The card data are then tokenized or encrypted by the payment processor and subsequently forwarded conjointly with transaction details to the acquirer. The acquirer, also known as the merchant bank, is in charge of routing this information to the valid payment scheme e.g. Visa, MasterCard, American Express, etc. In the next phase, the information is transferred to the card issuer to verify whether the card in use is legitimate and has sufficient funds to settle the transaction. If the authorization is completed error-free, the issuer then notifies back through the same channels to the merchant to conclude

sales and simultaneously proceeds to credit the payment to the merchant's account. (First Data 2010; Canadian Bankers Associate 2015.)

Over the years, plastic card processing has never ceased to evolve to accelerate the input and authorization process whilst reinforce transaction security. RFID (Radio-Frequency Identification) payment technology has currently been utilized on Visa cards to provide customers with a less-than-a-second, no-swipe no-PIN no-signature payment for purchases less than 20 Euros. Users just simply hover their Visa card up to a special contactless reader and wait for the transaction approval signal within less than a second. (Visa 2015)

FIGURE 16. Visa payWave – Contactless Payment (Visa 2015)

Mobile wallet is a derivative in-store payment processing method of plastic card, which adopts the same infrastructure except for data input method. Rather than requiring customers to physically enter the PIN code of the credit/debit card, mobile payment employs Near-field Communication (NFC) technology to securely interchange data between the mobile devices and a special terminal, which ultimately allows customers to use their phone with preauthorized card information to pay at the counter. (Geuss 2014.)

FIGURE 17. Google Wallet Mobile Payment Application (Fast Company 2013)

Apart from convenience and speed, mobile payment offers customers an enhanced level of security. On the grounds that NFC technology only operates in a fairly short range and is direction-sensitive, payments via mobile devices are highly tamper-proof as hackers need to get into an uncomfortably close zone to snag the data. Furthermore, the NFC chip embedded in the phone is programmed to only be active upon user's activation through two layers of passwords (phone's password and application PIN code), hence even in case of phone theft, the user's bank account remains secured. (Chandler 2012; Haselsteiner and Breitfuß 2015.)

Biometric payment is a newly-emerged POS technology which uses biometric modalities to identify a user and authorize a payment (Iritech Admin 2015). In essence, customers can walk into a store hands-free and use their specific biometric configuration e.g. fingerprints, finger veins, voice, face, etc. as their "card PIN code" to authenticate their identity and proceed with the payment (Rouse 2006). This payment technology, on top of the unprecedented handiness, is regarded as a breakthrough in payment security since biometric data are significantly immune to theft or frauds (Iritech Admin 2015). Fingerprint technology is one the most well-known and widely-applied biometric solutions for payment authentication, and has currently been adopted by Apple Pay and Zwipe – MasterCard (Biometrics Solutions 2015; Apple 2015; Zwipe 2015).

FIGURE 18. Apple Pay Touch ID (left) and Zwipe Fingerprint Card (right) (Apple 2015; Zwipe 2015)

3.2 Synopsis and assessment of Uniqul face recognition payment application

Synopsis:

Uniqul face recognition payment application appertains to the regime of biometric-based payment technologies, and in fact, boasts its position in the very vanguard of this realm. As the name signifies, Uniqul application is the world-first payment system that employs face tele-recognition to authenticate customers. (Isaacson 2013.)

FIGURE 19. Uniqul face recognition payment prototype (Pisarenko 2013)

Uniqul application operates on the foundation of Uniqul's patent-pending HyperGlide technology – a groundbreaking architecture that provides customers with a fast, convenient, accurate and secure payment method instead of the clunky extant practices. To delineate this technology in a simplified way, the author shall walk readers through a typical purchasing process done with Uniqul face-recognition payment application. This process incorporates two main phases along with a prerequisite sign-up phase:

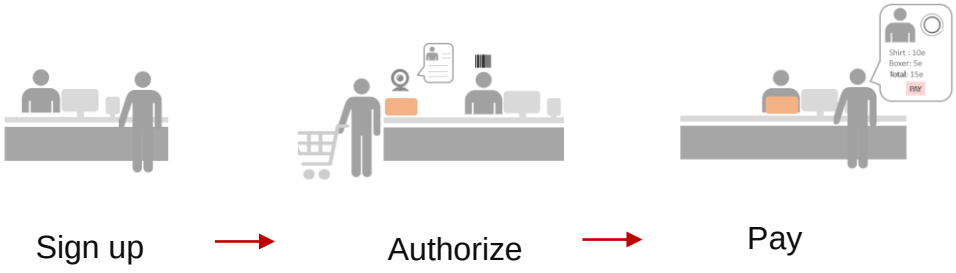


FIGURE 20. Purchasing process with Uniqul face-recognition payment application prototype (Pisarenko 2013)

At the outset, a customer has to register for Uniqul at an authorized cashier stand, where his face configuration is captured by a high resolution HD camera, then tokenized and stored in Uniqul cloud database. Upon registration, the customer is concurrently required to present his Identity Documents to the cashier if he wishes to apply for special purchase option (e.g. alcoholic beverages). The customer can then proceed to loading credits to his Uniqul cloud wallet and choose a preferred payment plan. Hereafter, this customer is eligible to pay with Uniqul at any store that accepts Uniqul technology. (Pisarenko 2013.)

An orthodox purchasing process with Uniqul application occurs quite expeditiously: right after the customer has shifted his goods onto the conveyor belt and awaits for the cashier to scan the barcodes, he is instantaneously recognized by Uniqul via the HD camera at the counter. On the back-end side, an array of routines of the identification module is executed: Uniqul first tracks and snapshots the face frame of the customer, then juxtaposes the freshly-captured image of the customer with the detokenized face configuration data downloaded from the cloud database via a discreet algorithm to gauge whether there exists a certain level of correlation. If the matching is verified, the customer can proceed to approving the transaction by just pressing “OK” on the customer screen and the money is debited from his cloud wallet. In augmentation, to preserve the accuracy level of recognition up to par, any newfangled face configuration feature from the fresh capture is imminently added to the cloud database. The entire process takes place in roughly one second. (Pisarenko 2013.)

Security of the payment and customer data is a core pillar of HyperGlide technology, hence a highly-sterile environment that prevents fraud and detects fraud is constantly ensured throughout every payment process. Fraud prevention consists of technological solutions to prevent intrusion and manipulation of customer data. There are two main layers of system security: secure centralized processing and secure local environment. Secure centralized processing is a method of performing all computations and maintaining all sensitive data in remote secure server environment - Central Processing Center. This center employs the highest level of security and access policies, in terms of connection rules, tokenization and data protection. Secure local environment policy verifies that the cashier stand is safeguarded from any changes in software composition. Hardware security is obtained by protected computer systems and certified CCTV equipment. Fraud detection policy generally allows information about purchases made via Uniqul to be transparent to the customer, by day and month, every time the payer is identified. This aids Uniqul and its customer to quickly detect any fraudulent activity, which can then be immediately reported to law enforcement agencies. (Pisarenko 2013.)

Assessment:

In this section, the author shall demonstrate a subjective evaluation of Uniqul face recognition payment application based on Strengths-Weaknesses analysis, delineated as in the table below:

TABLE 2. Evaluation of Uniqul Face Recognition Payment Application (Adapted from Pisarenko 2013)

Strengths	Weaknesses
Unique Selling Points: • Unprecedented processing speed • Superior payment security • For retailers: an exhaustive customer database • For end users: ubiquitous payment convenience Complementing Strengths • For retailers: Easy integration and high usability • For retailers: low cost • Augmented information channel	• For end users: subscription fee based on coverage • Not-fully-optimized convenience: - For end users: top-up account, low coverage - For retailers: Incomprehensive offer, long fund-depositing period • “Too tremendous” processing speed • Vulnerability of technology

Strengths

Unique Selling Points:

• Unprecedented processing speed of approximately 1 second, saving up to 70% of the conventional payment time with existing technologies – this, in a way, accelerates the checkout process of customers, and betters their shopping experience, whilst escalates checkout efficiency for retailers and could potentially help them cut off redundant staffs and to acquire more customers.

• Superior payment security – the highly-sterile payment environment offered by Uniqul along with biometric face recognition technology itself,

combine into a sturdy security fortress that safeguards not only the payment process but also customers and merchant data.

• For retailers: an exhaustive cloud database of customers – Uniqul builds and maintains a cloud database of the population, which contains beyond just biometric tokens, but customers basic information and their spending patterns as well. This vitally facilitates retailers in identifying their centric customers to tailor the most appropriate and profitable strategies on both individual and population level.

• For end users: ubiquitous payment convenience – Uniqul application eliminates the antiquated need of cash, credit/debit cards, mobile devices or any other gadgets and Identity Documents to conduct payments. Users of Uniqul can conveniently “pay with their face” at all locations that accept Uniqul, even in troublesome cases when they forget or lose their belongings.

Complementary strengths:

• For retailers: easy to integrate with existing infrastructure and effortless for cashiers to use – Uniqul technology operates principally on the grounds of cloud database, hence minimal equipment is required: a standard set of Uniqul comprises a merchant tablet, a customer tablet and a high-resolution HD camera. These devices are designed to concatenate seamlessly with other operating software and apparatuses. With regards to usability, Uniqul application requires less than one hour staff training before cashiers are proficient with the technology.

• For retailers: low acquisition, subscription and transaction cost – In comparison with the costs of existing biometric payment processing solutions, for instance, Zwipe Fingerprint Payment at 4,000 Euros acquisition fee along with 50 Euros for every extra Zwipe card and a normal card transaction fee (e.g. Chase Paymentech card transaction fee: 1.65% + 23 cents per transaction), Uniqul proposes a fairly economical offer at 1,500 Euros for a Uniqul standard set acquisition, 165 Euros for a

3-month subscription, and a fixed transaction fee of 0.31% + 8 cents per transaction (Zwipe 2015; Chase Paymentech 2015).

• Augmented information channel – aside from purchasing data, Uniqul customer screen simultaneously displays weather information, ratings of store and on-going promotional activities, which customers can skim through while waiting for cashiers to scan the barcodes. This, in addition to providing informational values to customers, enables retailers to tailor specific customer relationship management strategy e.g. offers, coupons or rebates to each buyer to increase customer retention rate.

Weaknesses

• For end users: entailed subscription fee – at the early stage of deployment, Uniqul charges its users an amount of subscription fee according to their chosen payment coverage. This might likely discourage users from adopting the technology as for the fact that most extant payment solutions are free for end users.

• Not-fully-optimized convenience – Since Uniqul application is still pending at its beta version, there are certain drawbacks that hinder a holistic optimization of both retailer and end user convenience, namely:

For end users:

- User account operates on a top-up basis i.e. users have to reload their Uniqul account when the balance runs low, rather than on the orthodox credit/debit card basis i.e. users can link their credit/debit cards to Uniqul and payments are automatically deducted from their bank account.

- During deployment phase, Uniqul suffers from low coverage with only a modest number of stores accepting Uniqul application; thus end users are not entirely “liberated” from their wallet or mobile devices and rejoice in a hand-free shopping experience, especially when treading through multiple stores.

For retailers:

- Even though Uniqul application can integrate seamlessly with any existing merchandising system, this is prone to yield tiresomeness to most retailers as for the fact that they would prefer a single unified front-to-back-end system to a segmented one, in which they have to manage payments to several POS system suppliers.

- Long fund-depositing period: Uniqul is currently executing fund-depositing to merchants on a weekly basis. This is seven times longer than the industry average e.g. Chase Paymentech deposits funding within 24 hours (Chase Paymentech 2015).

• “Too-tremendous” transaction speed: Uniqul’s allegedly too rapid processing speed, despite being seen as an outstanding feature, might adversely provoke skepticisms on accuracy and security of the application from both merchants and end users.

• Vulnerability: Uniqul HyperGlide technology is still under a patent-pending scheme, which suggests that there has not yet been an official legal protection for Uniqul face recognition payment application. Therefore, the longer it takes Uniqul to seize the market, the more vulnerable the technology shall become.

(Adapted from Pisarenko 2013.)

3.3 Chapter 3 summary and final verdict

The chief objective of this chapter is to internally investigate Uniqul face recognition payment application; from which the result shall later be coalesced with external environment analyses’ outcomes to ultimately provide a consolidated answer to the research question: *How viable is the Finnish grocery retailing market for the deployment of Uniqul face recognition payment application?*

In this chapter, the author has first addressed the general idea of POS system, then proceeded to briefing about Uniqul application as well as gauging it strengths and weaknesses. The key takeaway that the author wants to accentuate on is: Uniqul face recognition payment application possesses quite a series of stark core competencies, yet accompanied by significant weaknesses. It is noticeable that these downsides are essentially derived from the lack of time and resources to refurbish the application, and can acutely offset or even erode the strengths in the long run, if timely measures are not taken. Particularly in deployment phase, these weaknesses can act as dissatisfiers that spawn certain hesitancies for Uniqul customers when deciding on adopting the technology.

4 FINLAND MACROECONOMICS ANALYSIS

Ensuing the theoretical basis demonstrated in Chapter 2 and Chapter 3, Chapter 4 inaugurates the empirical research section with an analysis of Finland macroeconomics settings. For the sake of a brief but all-inclusive result, the PESTLE model presented in Chapter 2 shall be utilized in this chapter, however with certain modifications: the author only delves into the five elements that impose evident influences on the deployment of Uniqul application: **P**olitical, **E**conomic, **S**ocial, **T**echnological and **L**egal, whilst leaves out **E**nvironmental factor.

By the end of this chapter, readers can cursorily understand the Finland macroeconomics environment and acknowledge its most critical implications onto Uniqul application.

4.1 Political

Finland operates officially within the framework of a parliamentary-representative democratic republic and on the grounds of a multiparty political system. Its power is vested in the people, represented by the parliament and is underpinned by the proclivity towards consensus and pragmatism. (Ministry of Foreign Affairs of Finland 2015.) The Finnish Parliament is currently dominated by four biggest parties: Social Democratic Party of Finland (34 seats), National Coalition Party (37 seats), Finns Party (38 seats) and leading with the most seats (49 seats), Center Party of Finland. This could be interpreted that the present in-action Finnish policies and reforms are significantly influenced by the ideology of these prevailing parties, especially the Center Party of Finland and its leader, H.E. Mr. Prime Minister Juha Sipilä. (Laine 2015.) It is fairly noticeable that, in principle, these parties all share the same vision on the development of technology and innovation as the major driving force behind the future of Finland, for instance, the Center Party of Finland has committed to “make Finland a pioneer in creativity and competence”, while the National Coalition Party accentuates on exploiting all possibilities in technology to boost up the country (Centre Party of Finland - Keskusta

2015; National Coalition Party - Kokoomus 2015). As a result, the Finnish government has always been vigorously stimulating and emphasizing on the development of digitalization and innovation.

Amidst 2009, the Finnish government laid a milestone in its engagement with technological and innovation development by issuing the “Innovation Policy”, which is placed under the auspices of the Ministry of Employment and the Economy in coordination with the Research and Innovation Council, chaired directly by the Prime Minister. This policy ultimately targets to uplift the national innovation system by disbursing extensive research funding and creating abundant incentives e.g. legislation, procedure, access to international market, taxation etc. to motivate businesses to involve further in innovation activities. (Ministry of Employment and the Economy 2015.)

In supplementary to the policy, several governmental agencies were erected as pivotal actors to provide a keener facilitation to innovative companies and research units. The Finnish Funding Agency for Innovation (Tekes) is a flagship governmental organization, founded in 1983 to finance and support the internationalization process of projects that are prospectively beneficial to the economy and the society. (Finnish Funding Agency for Innovation - Tekes 2015.) Academy of Finland is another key state agency, established within the administrative branch of the Finnish Ministry of Education, Science and Culture to provide expert consultancies and funding to cutting-edge scientific research, as well as to steer innovative activities of universities and higher education institutes in Finland (Academy of Finland 2015).

With specific regards to retail payments innovation, just recently in June 2015, the Finnish government has taken a leap in the enablement progress by holding a joint conference among European Central Bank, Bank of Finland, researchers and market participants on innovation and regulation in retail payments. This conference, apart from scrutinizing the current retail payment landscape, has promulgated several regulatory measures to optimally foster the development of novel solutions that

promote efficiency and security in retail payments industry in Finland. (Bank of Finland - Suomenpankki 2015.)

4.2 Economic

According to International Monetary Fund – IMF (2015) and the Organization for Economic Co-operation and Development – OECD (2014) statistics, Finland is regarded as one of the most economically-developed countries in the world both in terms of Gross Domestic Product based on Purchasing Power Parity per capita (ranked 25th/187 countries at $40,350 in 2013) and the average household net-adjusted disposable income per capita (ranked 12th/187 countries at $27,927 in 2014). In recent times, the Finnish economy happens to appear rather volatile due to the immense consequences resulted from the global crisis in 2008 and the collapse of its major electronics and technology industry. Yet, albeit all the hurdles, Finland is still maintaining a high profile with 2015's Gross Domestic Product (GDP) expected to mark up to 187 billion EUR, increasing by 0.396% compared to 2014; inflation in January 2015 standing at -0.16% (7th lowest in Europe) and unemployment rate at 8.9% for 2014 (Common Euro area mean unemployment rate: 10%). (International Monetary Fund 2015.)

In the subsequent paragraphs, the author shall examine three sub-segments of the Finnish economy that directly relate to Uniqul application: the Finnish grocery retailing market, Information Technology (IT) industry and the Finnish payment landscape.

With regards to the grocery retailing market, it is evident to notice an ongoing revitalizing process, with a gradual rise in the value of grocery trade sales from 16.551 million EUR in 2013 to 16.705 million EUR in 2014. However as a side effect, this recovery brings along an imminent problem for the industry: as retail sales volume is steadily increasing (by 0.1% in 2015), the number of stores conversely declines (from 3171 stores to 3157 stores), which heaps on the current pressure of customer capacity on retailers. (Finnish Grocery Trade Association 2015.)

The Finnish IT and application industry situation seems more optimistic. Within the year of 2014, the industry witnessed a fervent growth of 20 percent along with a combined turnover of 7 billion EUR, raising its proportion in GDP to over 2%. This engenders a twofold implication: first, Finland has grown to be a prosperous market for software applications; second, the earlier IT developments has consolidated an excellent infrastructure and bedrock for future innovations. (Research Institute of the Finnish Economy 2008; The Federation of Finnish Technology Industries 2014.)

Magnifying into the Finnish payment landscape, it could be acknowledged that non-cash transactions are progressively becoming more prominent. Finland claims the world-largest number of non-cash payments conducted per inhabitant at 448, beside a tremendous annual growth rate of 10.6% in 2012, which outpaced any other European or North American countries. (World Payments Report 2014.)

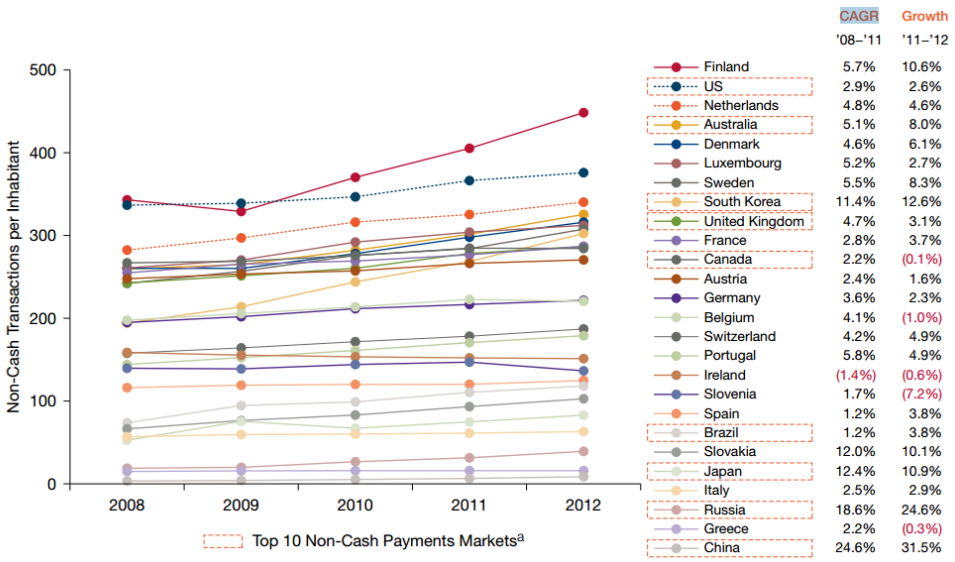


FIGURE 21. Number of Non-Cash Transactions per Inhabitant in Several Nations (World Payments Report 2014).

4.3 Social

Finland possesses a humble population of slightly less than 5.5 million residents, of which over a fifth dwell in the southern part, within Uusimaa area (particularly in the cities of Helsinki and Espoo). One of the most eminent characteristics of Finnish demography is the “constrictive pyramid” population model i.e. an inclination towards prolongated life expectancies and low birth rate. In just beyond a century from 1900 to 2012, the proportion of elderly people above 65 years old in the Finnish population has almost quadrupled from 5.4% to 19.9%, making it transcend the mark of one million. (Statistics Finland 2014.) Notwithstanding the alarming excessiveness of retired force, Finland still boasts a well-developed society with a top-notch Human Development Index – HDI, ranking 24th over 187 countries in the world (United Nations Development Programme 2014). This is allegedly attributed to the Finnish outstanding educational system which upholds an efficiently-functioning community despite the ever-increasing burden on a shrinking labor force. As indicated by the Organization for Economic Co-operation and Development - OECD (2014), Finland has always strived to ensure a minimum of 85% of its adults having at least upper secondary training, and maintain its education quality at the uppermost tier of the world.

Culture-wise, Finland is typified as a feminine society with high levels of uncertainty avoidance and indulgence (The Hofstede Center 2015). This could be construed as follows:

FIGURE 22. Indicators of Finnish Culture (Partially adapted from The Hofstede Center 2015).

First, Finland scores only 26 points on the scale of Masculinity, and is hence allotted within feminine countries. To a narrow extent, this intimates that in Finland, equality, especially gender equality is highly appreciated. Women have same rights, decision power and responsibilities as men do. In particular scenario of an individual purchase or a service registration, Finnish women own potent capability to decide and have absolute freedom of choice, with no dependency on their male counterpart and vice versa.

Second, with 59 points in uncertainty avoidance, Finns could be deducted to have the penchant towards unambiguity. This essentially implies that, the Finnish culture significantly praises the values of punctuality and time-savings, simplicity and precision as well as security and safety. On the flip side of the coin, high uncertainty avoidance simultaneously denotes a conservative nature that tends to be intolerant of unorthodox practices, and hence repel innovations. Nonetheless in the case of Finland, there exists an exemption for domestic technological innovations as Finns are contained with a strong sense of national pride and therefore shall do the most to support local products and revamp their home image.

Third, the relatively high score of 57 in dimension of indulgence signifies that Finns hold a rather positive attitude and desire to enjoy life to the fullest. They tend to place high degree of importance of convenience and self-contentment. (The Hofstede Center 2015.)

4.4 Technological

Finland embraces one of the world's most favorable environments for technological development, which owes vastly to the facilitation from public sector (Invest in Finland 2015). In 2015, the Finnish government has appropriated a total outlay of over EUR 2 billion for research and development, taking up to almost 1% of the GDP (Statistics Finland 2015). In addition to this monetary funding, the state concurrently backs the innovation progress by subsidizing several business incubators (e.g. Startup Sauna – an accelerator that supports early-stage startups) and sponsoring various networking events (Slush – an annual worldwide event of business angels and startups) (Invest in Finland 2015; Slush 2015; Startup Sauna 2015).

Over the recent years, the Finnish government has been placing more accentuation onto the particular segment of technologies that benefits the ecological system – either by rejuvenating the environment or reducing the level of waste and harm (Lovio, Nikulainen, Palmberg, Rinkinen, Temmes and Viljamaa 2011). This poses a double-edge effect to Uniqul application: on one hand, Uniqul can enjoy more support from the authority as the application itself operates on the foundation of cloud database, hence help reduce the load of technical waste and climate control costs; while on the other hand, Uniqul is prone to face a fiercer competition as government support might incite new entrants to penetrate into the market.

4.5 Legal

The legislation of Finland is constructed on the basis of the Finnish Constitution 1999. Supplementary acts or amendments are drafted by separate ministries in accordance with their mandate, presented and passed by the Parliament, supervised and enforced by the Ministry of Justice. Specific civil suits that associate with business conducts are majorly resolved by the Market Court (Markkinaoikeus). (Ministry of Justice, Finland 2013.)

Within the scope of this brief examination of legal factor in Finland PESTLE analysis, the author shall only highlight two fragments of the Finnish legislation that are tightly pertinent to Uniqul application: the patenting law and payment processing regulation.

Patenting in Finland is implemented and administered by the National Board of Patents and Registration, under the Finnish Patents Act and Patents Decree. As Finland is a participating party to a number of international treaties, patenting in Finland is simultaneously subject to these treaties, i.e. the Paris Convention, the Agreement of Trade-Related Aspects of Intellectual Property Rights (TRIPS), the Patent Cooperation Treaty, the European Patent Convention, and the Patent Law Treaty. A patent that is granted by Finland national patent office confers protection for a product or service only in the territory of Finland; whereas wider geographical protection requires further validation of the European Patent Office – EPO (patent protection in 30 countries) or the World Intellectual Property Organization – WIPO (patent protection in 130 contracting states). (Ministry of Employment and the Economy 2015.)

Payment industry in Finland is a highly-regulated segment that comes under the supervision of several authorities. The Finnish Financial Supervisory Authority is responsible for the granting and revoking of licenses to institutions; the Ministry of Finance proposes amendments to the financial legislation in combination with the new legislation drafted by the Ministry of Justice; the Finnish Competition Authority governs competition matters that are related to payment systems, while the Ombudsman is accountable for consumer protection issues. Of most pertinence to Uniqul application, data security are overseen by the Data Protection Ombudsman, in pursuance of the Finnish legislation for Protection of Privacy and the Finnish Information Society Code. Beyond the Finnish legislation, payment suppliers have to further comply with the European Union Credit Transfer and Electronic Money Directive, the Settlement Finality Directive, European Union Data Protection Directive, and optionally the Payment Card Industry Data Security Standard – PCI DSS and the Payment Application Data Security Standard – PA DSS.

(Iivarinen, Leinonen, Lukka, Saarinen and Veikko 2003; Data Protection Ombudsman 2015; PCI Security Standard Council 2010.)

4.6 Chapter 4 summary and final verdict

This chapter is designated to resolve sub-research question:

Q1. *What are the macroeconomic opportunities and threats that Finland poses to Uniqul?*

The author has therefore run an investigation through five core dimensions of the Finnish macroeconomic environment i.e. politics, economics, society, technology and legislation, so as to comprehensively pinpoint all major beneficial and inimical implications that the macro-settings impose on Uniqul application. Table 3 summarizes and ranks these implications in terms of impact magnitude and immediacy.

TABLE 3. Summary and Categorization of Macroeconomic Implications on Uniqul Application (Adapted from Aaker 2013).

Impact / **Immediacy**	**Low**	**High**
Low	(-) Upsurge in elderly population that increases reluctance to adopting new technology (+) Highly-regulated payment industry that safeguards Uniqul application from improper business conducts	(+) Recovery in retail sales volume intensifies the customer capacity pressure on retailers (-) Limited protection conferred by the Finnish Patent and a lengthy patenting process for wider geography that increase the vulnerability of Uniqul (-) Governmental substantial funding for technological advancements in general

		and payment innovations in particular might provoke newcomers into entering the industry, thus aggravating the competition.
High	(+) Finland becomes a prosperous market for software applications (+) Well-educated society that is capable of adopting advanced technology (+) Favorable cultural traits i.e. preference for accuracy, security, punctuality, time-savings, convenience, that motivate the adoption of Uniqul	(+) Governmental massive facilitation for technological advancements via the Innovation Policy and several state agencies (+) Governmental specific support for payment industry innovations and eco-friendly technologies (+) Favorable settings for non-cash payment solutions including biometric payments (-) Complex regulations and standards in payment industry that might sprout complications for Uniqul to tailor the application accordingly

(+): Beneficial Implications – Opportunities (-): Inimical Implications – Threats

On a general level, it can clearly be seen that Finland offers an auspicious macro-environment for Uniqul face recognition payment application, with the benefits outweighing the inimicalities, especially in the forthcoming short run. However, this does not sufficiently ensure the viability for the deployment of Uniqul application as the scope of macro-environmental

impacts is too far-flung, hence indiscriminate and lacking of the accountability of microeconomic determinants (Thakur 2010).

5 THE FINNISH PAYMENT INDUSTRY ANALYSIS

Chapter 5 projects to iron out the deficiencies of macroeconomics scanning in Chapter 4 by digging more thoroughly into the microeconomic dimension, particularly the competitive scenario of the Finnish payment industry. In order to better glean actionable insights from this examination, the author shall bisect the chapter into two themes:

Sub-chapter 5.1: Porter's Five Forces analysis of the Finnish payment industry

Sub-chapter 5.2: Competitors analysis

By the end of this chapter, readers are able to visualize the ongoing competition in the Finnish payment industry as well as to get a grasp of its incumbents along with their probable influences on Uniqul.

5.1 Porter's Five Forces analysis of the Finnish payment industry

The payment industry is an expansive ecosystem that encircles complicated sets of players, ranging from parties of the payment card network (including acquirers e.g. Vantiv, First Data, Elavon; issuers e.g. HSBC, Bank of America; card schemes e.g. Visa, Discover, MasterCard; Independent Sales Organization (ISO)/ Member Service Provider (MSP)/processor e.g. PayPros, VersaPay), to incumbents of the alternative payments subset (including online bank transfer providers, checks, billings and invoices issuers, offline cash issuers, cryptocurrency miners (e.g. Bitcoin, Namecoin), electronic gateway providers (e.g.Payflow Pro)), and further to digital wallet providers (e.g. Apple Pay, Google Wallet, Paypal wallet) (Heggestuen 2015, About Payments 2015). Since Uniqul application, in its current beta version, essentially covers the entire transaction operation from customer's account to merchant's account, it is justified to analyze the payment industry as widespread as it is intrinsically. However, in the scope of this chapter, the author shall curtail the realm of payment industry to only consisting of two actors that closely share the

core business of “electronic payment processing in offline stores” with Uniqul: credit/debit card processors and digital wallet providers.

5.1.1 Threat of new entrants: lower medium

As suggested in sub-chapter 2.3, threat of new entrants to the Finnish payment industry can be gauged hinging on the intensiveness of entry barrier and the severity of anticipated retaliations from extant contenders (Porter 2008).

Regarding the former determinant, the blockade that newcomers have to overcome to penetrate into the Finnish payment industry is believed to be of great height. This is majorly owing to the economies of scale that prevail in the industry. According to a study by Beijen and Bolt from De Nederlandsche Bank (2007), economies of scale in payment industry are fairly significant as doubling in the payment volume will only raise operating costs (labor cost, capital cost and technology cost) by approximately 25 to 30 percent, thus leading to an up-to-40 percent reduction in average cost. The effectuation of the Single Euro Payments Area – SEPA in 2008 (officially started in Finland in 2010 after transitional period), which vigorously prompts the acquisition and merger of several payment service providers, has additionally aggravated this cost disadvantage of small-scale new entrants since extant incumbents can further boost the exploitation of economies of scale through the increase in size (Beijnen and Bolt 2007). In 2012, Nets acquired Luottokunta – Finland’s largest payment card company to consolidate its dominant position in the Northern European payment industry. This resulted in a considerable decrease in Net’s operating costs and an upturn in Nets’ operating profit margin from 18.02% in 2012 to 19.68% in 2013, which consequently layered up the cost-advantage entry barrier to the Finnish payment industry. (Nets 2013.)

Capital investment requirement is another factor that amplifies the hurdle to enter the Finnish payment industry. Payment Council Group from Bank of Finland (2015) intimates that the establishment of a new payment

service often requires intensive and long-term investment plans, which hence involves high risk of uncertainty. Apart from conventional overhead costs to set up a business in Finland (e.g. legal and mandatory procedures, office rental and other fixed assets, salary for human resources and accounting personnel, patenting and financial license fees), newcomers into the payment industry are as well subject to a massive investment in IT systems, which averages at roughly EUR 10 million for the first round venture capital financing (Series A) for a card payment processor, and continues in 7 to 8 rounds. (Payment Council Working Group - Bank of Finland 2015, CrunchBase 2015).

An augmented layer of bricks to the entry barrier is attributed to brand identification of entrenched payment service providers. In Finland, Verifone has built up its image as a prominent and trusted player of the industry by being adopted as the payment processor for the two largest Finnish grocery retailing chains: S-group and Kesko group in almost 2,000 stores; Nets, likewise claims its brand significance with another weighty piece of the market share from the accounts of Luottokunta and Nordea Merchant Service (Nets 2015, Finnish Grocery Trade Association 2015). This creates an inclination among the Finnish grocery retailers towards either sticking with or considering to choose only between these two payment processors. (Jyrkönen and Paunonen 2003).

Projected retaliation from industry insiders is the second determinant of new entrants' influx volume. Retaliation acts often sprout in an environment that is stagnant and contains resource-abundant contenders. (Porter 2008.) Payment, by its nature, is an ancillary service, which dictates that growth of the industry is tightly clung to external factors such as trade volumes and consumption budget. From an internal perspective of a payment service provider, this essentially implies that the industry is restricted and "cannibalistic", i.e. new payment services are likely to eat up the market shares of existing incumbents rather than growing the market. Therefore, retaliation by extant contenders against newcomers to safeguard their shares is an apparent course of action. (Payment Council Working Group - Bank of Finland 2015.) However, concerning the case of

the Finnish payment industry at this point, the probability of retaliation acts is anticipated as unsubstantial due to two primary reasons. First, the card and digital wallet retail payment methods are gaining momentum in Finland with the number of Electronic Funds Transfer Point of Sales Terminal - EFTPOS escalating exponentially by over 95.1% in just 5 years from 2005 to 2010 (Finanssialan Keskusliitto 2011, Lankinen 2014). Hence, new entrants to electronic payment, rather than orthodoxly threatening the existing payment processors, are joining the force to supersede the traditional cash payment and expand the market for the industry. Second, the grocery retailing section of Finland is progressively recovering with sales volume constantly increasing by 0.1% in 2013 and 2014 (Finnish Grocery Trade Association 2015). This lifts the threshold of profitability for payment industry while simultaneously creates additional market shares for new entrants.

In a nutshell, threat of new entrants to the Finnish payment industry, having combined the degree of two determinants, could be viewed as **lower medium.**

5.1.2 Bargaining power of suppliers: lower medium

Suppliers to payment industry, in the context of this very analysis, is an encompassing concept which encloses from hardware manufacturers (i.e. payment terminal providers, tablet providers) to acquiring banks (i.e. merchant account providers) and payment schemes (i.e. interchange network providers). Hereabouts, the author, however chooses to particularly treat acquiring banks as suppliers by reason of them being the most contiguous and influential to payment processors in the payment value chain.

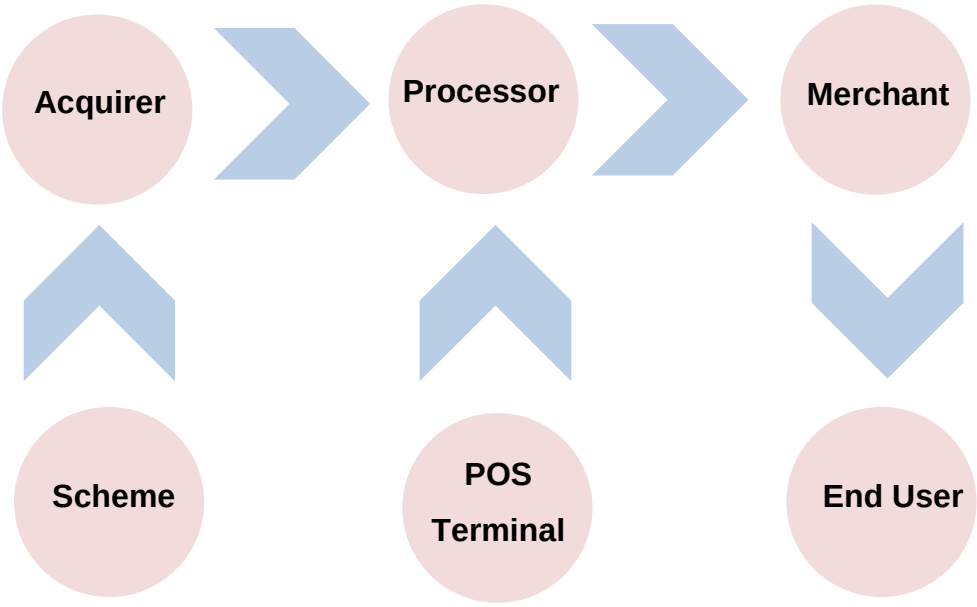


FIGURE 23. Payment Value Chain (Adapted from Ingenico Group 2015).

By the end of 2014, there existed a total of 291 credit institutions in Finland, yet the market of merchant acquiring is predominantly taken over by the four largest banks of OP Group (~35% share), Nordea Bank Finland Plc Group (~30% share), Danske Bank (~10% share) and Handelsbanken Group (~5% share) (Finanssialan Keskusliitto 2014). This indicates a highly concentrated terrain where almost 80% of the market are owned by the top 1% players. Nonetheless, it is insufficient to conclude an enhanced power of acquiring banks, given that concentration level of payment processors is relatively analogous to that of merchant acquirers, let alone the fact that biometric payment processing sub-industry in which Uniqul operates could be categorized as even more concentrated (Pisarenko 2013).

In auxiliary, there are further contributing factors that dictate the bargaining power of acquirers in Finland, with a major one being the threat of forward integration (Potter 2008). According to Capgemini Finland (2012), merchant acquirers are moving towards outsourcing the conventional in-house payment processing to third-party providers in view of focusing resources to their core business. In 2014, Handelsbanken outsourced its mobile payment processing to Verifone so as to timely meet the emerging

needs of customers; whereas in 2015, Nordea divested its merchant acquiring business to Nets in the interest of eluding the substantial investment cost required to consolidate the segment's competitiveness (Nordea Bank Finland Plc Group 2015, Verifone 2014). This trend scales down the threat of forward integration that intimidates payment processors, thus contracting the clout of acquirers.

Another element that affects the power of acquirers is their relative importance in the operation of payment processors (Porter 2008). It appears to be quite apparent that acquiring banks play an indispensable role in the business of payment processors as they are the entities that provide merchants with preliminary authorization to accept payment cards before payment processors can come into play (Ingenico Group 2015). The vice-versa role of payment processors in banks' business however is not akin. Income from transaction and commission fee accounts for an inconspicuous share within the total revenue of banks in Finland: e.g. 3.3% for Nordea Bank Finland Plc Group, 26.1% for OP group, 22.3% for Handelsbanken (Finanssialan Keskusliitto 2014). This one-sidedness elevates the bargaining stature of acquirers against payment processors.

All in all, bargaining power of suppliers to payment processing industry is assessed to be **lower medium.**

5.1.3 Bargaining power of buyers: high

Buyers of payment processing industry, strictly projected from the viewpoint of Uniqul face recognition payment application, comprise grocery retailers and end users, since these two groups pay for and hence are the recipients of Uniqul payment service. Within the locality of this Porter's Five Forces analysis, the author shall only evaluate the bargaining power of the more important and direct group of buyers – grocery retailers, while leaving end users group to the later chapter.

According to a report by the Finnish Grocery Trade Association (2015), in 2014, an aggregate of 3,157 stores was in operation across Finland, of which the majority were owned by S-group (with 1,020 stores) and Kesko

group (with 929 stores). This suggests a hyper-concentrated market – a duopoly to be exact – with two dominant incumbents manipulating up to 78.8% of the market (Finnish Grocery Trade Association 2015). Nevertheless, alike the case of suppliers mentioned in section 5.1.2, this merely raises the relative position of buyers.

Instead, there are several other determinants that expressively ramp up the bargaining power of grocery retailers. Incipiently, the fact that purchase volume of payment processing service from grocery retailers in Finland is significantly bulkier than that from other industries (e.g. average 5 payment processing terminals/grocery store to average 3 terminals/fast food store, 2 terminals/ clothing shop) gives this group of buyers the edge over sellers in the bartering process. Furthermore, the nature of grocery retailers having moderately humble profit margin (S-group: 0.05% for 2013; Kesko Group: 1.60% for 2014) coupling with the circumstance of payment processing cost accounting for a sizeable proportion in retailers' budget (approximately 0.57% - tentative calculation shown in Appendix 1) imply that buyers are highly price sensitive, and hence have high bargaining incentive (Kesko Group 2014, S-Group 2014). Marginal switching cost of payment processors is another factor that uplifts the negotiating stature of grocery retailers. More often than not, the cost spawned from changing payment service supplier is not considerable as it traditionally consists of no service termination cost (except in the case of early termination before 36-month minimum service term, where it costs EUR 48 per card terminal), no disposal cost (all terminals are returned to suppliers) with just minor technical supervising, staff retraining and counter redesigning costs (Verifone 2012).

In a word, the upper demonstration indicates a **high** bargaining power of buyers of the Finnish payment industry.

5.1.4 Threat of substitutes: low

Substitutes of the Finnish payment processing industry connote direct cash and online payment as these are the two most commonplace alternatives to pay for groceries in Finland (Lankinen 2014, Kesko 2015).

Concerning the former, direct cash payment has been constantly losing status due to its inferiority towards card and mobile payment. According to Lankinen (2014), 73% of surveyed Finns insisted that they preferred cards to cash as their payment method by virtue of enhanced security and more economical real cost. In supplementary, the Finnish Ministry of Employment and the Economy has recently rolled out initiatives to eliminate cash and the grey economy, which further on depreciate the threat of cash payment to payment processing industry (Lankinen 2014).

Much alike the situation of direct cash, online payment for groceries in Finland is relapsing detrimentally after its commencement in the early years of the century (Otto 2012). Yle (2010) intimates that Finns are generally not intrigued by the convenience of paying online for groceries because of the steep additional cost from logistics, and therefore will still prefer the traditional concept of shopping. In fact, there survives just a handful of players in the Finnish online grocery retailing industry, namely Ruoka.net, K-ruokakauppa.fi, Makumaku etc., which hence implies an insignificant intimidation that online payment imposes on the payment processing industry (Yle 2010).

In short, it is evident to notice that the Finnish payment processing industry is confronted with a **low** threat from substitutes.

5.1.5 Rivalry among incumbents: medium

Contenders in the Finnish payment processing industry, as stated earlier in the introduction of this sub-chapter, are identified as card processors and digital wallet service providers. In the following section, the author decides to treat these two groups as a syndicate in the interest of a

general assessment before dismantling them for in-depth scrutiny in the ensuing sub-chapter 5.2.

From an overall point of view, existing competition within the industry can be positioned at a medium level. This is attributed to a well-nigh balance between the factors that abate and those that intensify the rivalry.

On one hand, the accelerating growth of card and mobile payment is rapidly superseding the traditional cash settlement, which consequently creates additional market for extant payment service providers and alleviates the “cannibalistic” nature of payment industry (Finanssialan Keskusliitto 2011). Moreover, as the Finnish payment processing industry is characterized with a duopoly of Nets and Verifone overshadowing minor small-scale startups and businesses, it is less likely for industry battles to be sparked, let alone to be prolongated, unless initiatives are taken by these two dominant players.

On the other hand, capacity requirement of payment industry is rigorously motivating incumbents to get involved in competition. Having been denoted in section 5.1.1, scale is a critical element for payment processors to increase their profitability, hence contenders are highly committed to the objective of expanding, or at least preserving their market (Beijnen and Bolt 2007). This, therefore provokes an outburst of share-snatching battles in the payment industry. Regulations from authorities are another factor that racks up rivalry in the industry. According to the Organization for Economic Co-operation and Development – OECD (2012), in order to protect consumer welfare from misconducts of payment service providers, participating members (including Finland) are guided to reduce the clout that payment processors have over merchants. In particular, OECD proposes to void out rules that bind merchants to payment service suppliers, and thus eases the payment service switching process of merchants (The Organisation for Economic Co-operation and Development - OECD 2012). This directly exacerbates the share-snatching competition among incumbents.

By and large, rivalry among incumbents in the Finnish payment processing industry is noted to be **medium**. However, it is vital to concurrently bear in mind that competition existing within the industry is more to the end of differentiation-oriented than cost-oriented. (The Organisation for Economic Co-operation and Development - OECD 2012).

5.2 Competitor analysis in the Finnish payment industry

As supplement to section 5.1.5, this sub-chapter delves deeper into the rivalry of the Finnish payment processing industry by dissecting the competitors on a more specific level. The investigations project to build up a systematic documentation of the key players in the industry in order to assist Uniqul in harnessing or counteracting the opportunities and threats posted from its immediate environment.

5.2.1 Identifying competitors

Within this initial phase, the author pinpoints the key contenders of the Finnish payment processing industry using strategic groups that are constructed on criteria of relevance, technology and size. For each of these clusters, a representative is then appointed for an in-depth study in the following section 5.2.2. The identification outcome is presented in table 4.

TABLE 4. Strategic Groups of Competitors in the Finnish Payment Processing Industry

<table>
<tr><th colspan="4">Strategic Groups</th><th rowspan="2">Representatives</th></tr>
<tr><td></td><td>Relevance</td><td>Technology</td><td>Size/Area</td></tr>
<tr><td>1</td><td rowspan="2">Indirect Competitors</td><td rowspan="2">EMV Card, Magnetic Stripe Card, NFC technology, Mobile Payment technology</td><td>Large/ Global Player</td><td>Verifone</td></tr>
<tr><td>2</td><td>Large/ Europe: Nordic</td><td>Nets</td></tr>
<tr><td>3</td><td>Indirect Competitors</td><td>Mobile Payment</td><td>Medium – Small/Europe: Nordic</td><td>iZettle, Elisa Lompakko</td></tr>
<tr><td>4</td><td>Potential Competitors</td><td>Mobile Payment</td><td>Medium/ the USA</td><td>Square</td></tr>
<tr><td>5</td><td>Potential Competitors</td><td>Biometric</td><td>Small/ Norway</td><td>Zwipe</td></tr>
</table>

There are two annotations to the construction of these strategic groups:

First, as Uniqul face recognition payment application is a breakthrough innovation, there are technically no direct competitors. Hence the closest relevance identified is indirect competitors.

Second, it is observable that there might exist other strategic groups, for instance, Finnish card processors group (e.g. OP group), potential global entrants group (e.g. Chase Paymentech), etc.; however due to limited time and data resource, the author shall restrict the analysis scope to only the above 5 groups which are believed to be most relevant and impactful to Uniqul face recognition payment application.

5.2.2 Analyzing the competitors

Ensuing the first phase of constructing the strategic groups, this section proceeds to scrutinize the allotted representative of each group on the grounds of Aaker's-and-Porter's-combined competitor analysis model, demonstrated as in sub-chapter 2.4. The author, in pursuance of harvesting the most applicable intelligence to the deployment of Uniqul face recognition payment application, chooses to put accent on the indirect competitors, whilst only to skim through the potential competitors.

5.2.2.1 Verifone

Verifone, headquartered in San Jose, California, is an American multinational corporation that is recognized globally as the leading provider of innovative terminals and secure payment solutions for merchants. Its fame has spread through 150 countries worldwide and officially pervaded to Finland in 1989 with its one millionth terminal. (Verifone 2015.)

FIGURE 24. Verifone's logo (Verifone 2015a).

a. Future goals

Since its incorporation in Delaware in 1981, Verifone has designated the kernel of its business as system solutions – a section that encompasses the engineering of a whole range of point-of-sale electronic devices from

countertop and PIN pads, mobiles and portables to self-service equipment. In the recent lustrum, Verifone, however has been stepping out of the comfort zone and diversifies its capital to a new segment of payment services which includes payment processing service, terminal management solutions, security solutions and etc. In 2014, particularly in Europe, the Middle East and Africa region, income from services accounted for roughly 53% of Verifone's regional aggregate revenue stream. (Verifone 2015b.) According to Verifone's interim CEO Richard McGinn (2013), substantial investment in technology to lift Verifone's payment service section to the industry-pioneering state shall continue to be the long-term pathway for the company, especially after the its disastrous net loss of over $295 million in 2013, when Verifone lagged behind customer's technology refreshes.

Regarding short-term financial objective, Verifone appears to be rather cautious and circumspect after its stumble in 2013. For 2015, the company forecasts a net revenue of $1.99 to $2 billion, which is much lower than analysts' consensus estimation of $2.03 billion (Ausick 2015). This guidance could be interpreted as a reflection of Verifone's defensive and unwilling-to-take-risk stance – an abnormal trait of the American corporation: while in 2012, Verifone projected the year sales to be $1.925 billion, which was a 48.07% growth from 2011, in 2015, the growth rate is modestly expected to only reach 6.5% (Verifone 2015b, Verifone 2013).

b. Organization & culture

Verifone pursues a decentralized organization structure in which operating entities are dispersed around the world and held connected through a 24/7-available electronic knowledge network. This configuration denotes an aggressive nature of Verifone as it elevates the company to a vantage point in terms of localization and productivity optimization whereas in return demands extra travelling efforts for effective communication. (McAuley, Duberley and Johnson 2007.) To hold such an extensive structure together in a slick operation, leadership is accredited as a critical determinant. Verifone's executive officers, elected annually by the Board

of Directors, are allegedly the key dynamics of corporate governance. It is headed by CEO Paul S. Galant and constitutes 7 other executive officers who are in charge of upholding the company as “one Verifone” to achieve excellence in all products and services provided (Verifone 2015b, Shaw 2015). The structure and human resource assignments of Verifone’s executive officers rationally provides certain inferences about the company’s strategic approach and its core concern. Regarding the leading role, Paul S. Galant was appointed as the CEO in 2013, amidst Verifone’s business turmoil and struggles. He possesses a solid background in payment industry with his years being the CEO of Citigroup Inc’s Enterprise Payments business in focus on innovative digital payments service and Global Head of the Cash Management business – one of the largest innovative payment processors globally. (Verifone 2015c.) Conjoining Verifone’s situation upon Galant’s inauguration and his competencies, it could be deemed that Verifone is attempting to attenuate its heavy reliance on hardware business and accentuate more on R&D of payment services section. This proclivity is further elucidated by Verifone’s delegation of Alok Bhanot – an adept in payment technology, who was the technology head of eBay, PayPal, and Visa and CEO of Inkiru – a next generation predictive analytics platform, to be its Executive Vice President and Chief Technology Officer in 2013. Alok Bhanot’s solid expertise in payment innovations along with his specific experience with Paypal wallet might serve as an obscure indication that Verifone is implicitly aiming to seize the next era of cloud-based payments in payment service technology. (Verifone 2015c.)

Aside from organizational settings, Verifone’s corporate culture is seemingly another implication towards its assertive strategy. Long has it been renowned that Verifone functions within a “culture of urgency” or, as its former CEO Hatim Tyabji refers, a “blueberry pancake” culture. This means Verifone business never lies in dormant state; workloads are under process 24/7 as they are circulated around the globe to different offices to be continuously resolved. A third of Verifone’s staffs travel a decent proportion of their time, usually every six weeks for five days, to either

meet customers or participate in an internal conference. Verifone binds its intense-functioning employees and keep them motivated with a “batter” of superior compensation and treatment. It is one of the rare businesses to provide stock options to all employees, issue a “bank account” for employees to store their unused vacation time and found a personally-close relationship between top managers and normal staffs.

c. Assumptions

With reference to Verifone’s 2014 Annual Statement (2015), it could be evidently deduced that the American corporation perceives the payment industry as an ever-evolving environment with radical upcoming modifications. It speculates that the payment landscape will advance on a technology-oriented route where securer, more convenient and specifically-tailored payment solutions shall take dominance. This is further specified by Verifone that obsolete methods of cash payment or magnetic stripe cards are soon to be ruled out and replaced by a short term of EMV cards and eventually by NFC technology on mobile or portable devices. (Verifone 2015c.)

Concerning competition, Verifone anticipates growing intensity in the payment industry, which is majorly attributed to the emergence of new disruptive innovations both within and outside the traditional industry. However the company still exhibits firm confidence that its competitive advantages of 30-year brand image, superior security infrastructure, global operating scale, low cost of ownership, and massive investment in R&D shall continue to assist Verifone in withstanding the hardship of the payment industry. (Verifone 2015c.)

d. Current strategies

Verifone’s corporate strategy is erected on the foundation of two approaches: organic R&D and strategic acquisitions. These are the two most prevalent undertakings that the American corporation has been alternatively implementing over the past lustrum and quite possibly, for the forthcoming future.

In respect of the former, Verifone's R&D embraces two principal fields: design and development of hardware products, and innovative advancement of payment service software. Yet over the years, the company has been constantly shifting capital away from the hardware enhancement segment to focus more on bettering its payment service solutions, terminal management services and additional functionalities, such as advertising, loyalty programs, couponing and data analytics. In aggregate, the year of 2014 recorded a $203 million investment of Verifone in R&D activities (i.e. an 18% increase from 2013 and 34% increase from 2012) along with the allocation of 1,637 R&D employees, which accounts for 31.2% of the company's total workforce.

Regarding the latter approach, acquisition is identified as a primary strategy that Verifone has been harnessing to expand its operation geographically. In August 2011, the American corporation made its first significant acquisition of Hypercom Corporation, a major worldwide POS payment solutions provider, in the view to seize the Asia-Pacific market. Three months later, it acquired the Swedish electronic transaction company ETC, who was operating Point international business, to lay the first stone of its empire in the Nordic area. Verifone's mainline acquisition process ensued with the purchases of EFTPOS New Zealand Limited and Sektor Payment Limited in 2013, signifying its penetration into the Oceanic payment market. (Adapted from Verifone 2015c.)

e. Preliminary verdict for Verifone

Based on the above scrutiny of future goals, human resource allocations, assumptions and current strategies, it could be palpably adjudged that Verifone is shifting towards the payment service segment in a technology-oriented manner. The intensity and immediacy of this shift is gauged to be at high level, hinging on the company's incremental investment in R&D (roughly one third of the total operating expenses) and its purposeful appointment of the new management tier.

In the event of arising competition, the probable course of reaction from Verifone, within the subsequent short-term future, is conjectured to be a

technology race, rather than the more aggressive move of acquisition. This is due to two reasons: first, the company is still striving in its integration phase after several sizeable acquisitions; second, Verifone is currently unwilling to take substantial risks from monetary expenditures for acquisitions. Nonetheless, in the longer run, the author projects that Verifone will soon return to its beaten track of aggression and might consider acquiring its competitors, especially small startups with breakthrough innovations. In the worst case scenario of ceaselessly-growing rivalry, the American corporation is anticipated to susceptibly resort to its massive economies of scale and run a price competition.

5.2.2.2 Nets

Nets, headquartered in Ballerup, Denmark, is Europe's second largest card processing service provider, serving a total of more than 500,000 merchants and handling over 1 billion transactions annually. It was the outcome of the merger between Danish PBS electronic payment service holding and Norwegian company, Nordito AS back in 2010. In 2012, Nets laid a milestone in its operation by acquiring the Finnish largest payment card solutions company Luottokunta, thereby expanded its market outside the former restriction of Norway and Denmark to Finland as well as solidified its stronghold in the Nordic region. (Nets 2015a.)

FIGURE 25. Nets' logo (Nets 2015a).

a. Future goals:

From the very dawn of its establishment, Nets has defined its corporate long-term target as becoming the frontrunner in the Nordic payment and digital service industry (Nets 2012). Throughout roughly six years of operation, the company has been determinedly adhering to this goal with

several infrastructure consolidations in Norway and Demark in conjunction with strategic expansions to other Nordic states. In March 2014, Nets underwent a momentous transfer of ownership from the Danish and Norwegian banks to the Consortium Capital Group – a major global venture capitalist with 30 years of experience in banking and payment industry. This could be indubitably translated to an upsurge in the Nets' future effort to achieve its goal and even further on, to become a Northern European leader within the payment industry. (Bain Capital 2014.)

Aside from the goal of becoming the location leader, Nets also erects its vision of creating the future of digital values. In specific, Nets projects to provide securer, lower-cost, cross-channel integrated, and more efficient payment solutions which will massively facilitate and prompt the use of digital money, digital information and digital identity. This vision has been constantly taken into progress over the years, recently marked by the success of launching the ISO-20022 based real-time payment platform in Denmark in November 2014. (Nets 2015b.)

Regarding short-term financial objectives, the change in ownership of Nets is likely to suggest a higher expectation for the upcoming period since more operating resources, expertise and relationships are put into play. As 2014 has recorded Nets' positive figures of 1.2% increase in revenue and 2% rise in EBITDA before special items margin, the author speculates a much higher outlook from the company for the year of 2015 and further. (Nets 2015b.)

b. Organization

Nets lays its 3-billion-Euros-net-worth business on the foundation of an employee-centric organization, in which the Nordic company has been making decent investment to uphold the competencies and loyalty of its personnel. It puts out a set of four initiatives, comprising talent management, performance management, competence management and cultural change, with the aim to substantially strengthen its work force. These initiatives essentially center on enhancing employees' aptitudes through specific training, appraising performance regularly, and

transfusing the corporate ACT culture (Accountability, Customer-driven, Together). In 2013 and 2014, staff costs have persistently accounted for a rough 50% of the total operating expenses of Nets, which could partially signpost the company's orientation towards a long-run and stable development. (Nets 2015b.)

Within the organization dimension, management tier is a critical subset that Nets pays a great deal of attention to. In 2014, the company arranged a large-scale revamp in the company's executive committee, altering the Group CEO, CFO and Executive Vice President of IT & Operations. Bo Nilsson was promoted from his position as CFO to be the new CEO in August, replacing the former Ms. Matte Kamsvag. This change, to a certain extent, might imply the inclination of Nets' strategy towards the acquisition growth approach due to the fact that the company could utilize Nilsson's prowess in finance and strategic planning along with his experience as JP Morgan Chase Vice President to more keenly analyze evaluate, and benefit from acquisition deals. In complementary, the appointment of Klaus Pedersen, an expert in investment, acquisition and merger from TDC A/S, as Nets' new CFO additionally consolidates the above idea of an acquisition-oriented business approach of the Nordic company. (Nets 2015b, Pedersen 2015.)

c. Assumptions

Alike Verifone, Nets also sees the payment industry as a fast-moving environment where disruptive innovations, both in fields of security and authorization solutions, are predicted to emerge as a major industry-steering force. However, it appeared to be rather apparent in Nets Annual Report 2014 that the Nordic company put a bolder highlight on the specific European trend of strategic alliances and consolidations after the erection of SEPA. (Nets 2015b.) According to Nets (2015b), entrenched incumbents in the Nordic region are now having the proclivity towards partnering with or acquiring niche non-bank players in the interest of reducing time to develop and catchup with innovative payment solutions, especially on the frontend.

d. Current strategies

Nets' corporate strategy is a compact of a two-layer approach: expansion and consolidation. On the ground layer, the Nordic company aims to strengthen its geographic footprint in both horizontal and vertical dimensions. This means, withal expanding its presence in the Nordic region, Nets concurrently develops its service portfolio by supplementing further offerings and channels so as to more efficiently realize the economies of scale. The upper second layer involves the company consolidating its established foundation, which primarily encircles operations to enhance customer experience and to reinforce bank partnership. Nets' penetration process into the Finnish market is a fine delineation of how the company has strictly executed this strategy: in 2012, Nets acquired Luottokunta, thereby set foot in Finland; this is followed by Nets purchase of the Finnish e-commerce Paytrail Oyj in 2014 in order to better service the high demand of internet shopping from Finns; the Nordic company is now at the consolidation phase where it has just initiated its first move of taking over Nordea's merchant acquiring business in July 2015. (Nets 2015b, Nordea 2015.)

e. Preliminary verdict for Nets

It is evident to notice from the analysis that for the time being, the centric focus of Nets is to fortify its stronghold in the Nordic states. This approach is unambiguously communicated from the company's radical change in ownership and in managing staffs, its major awareness of the SEPA's impact on mergers and acquisitions, as well as from several acquisitions undertaken lately by the company, such as the purchases of Swedish Payzone Nordic A/B, Finnish Paytrail Oyj, and 85.5% of DIBS Nordic Payment Services A/B. Nevertheless, Nets also puts certain accent on its long-term vision of creating the future of digital values on a global scale. The company has been conducting several preparatory actions for this outlook, ranging from upholding the competencies of its personnel to consistently investing in technology innovations. (Nets 2015b.)

In the scenario of competitions, it is expected that Nets shall deliver prompt and vigorous retaliations specifically to those emerging in the Nordic region. For small-scale innovative startups who operate in the respective area and pose significant threat to Nets, the company is prone to consider the acquisition of these entities.

5.2.2.3 iZettle

iZettle is a Sweden-based innovative mobile payments company founded in April 2010 by Jacob de Geer and Magnus Nilsson. The company offers out to the market a single application and device for mobile payments called iZettle. This payment solution, in brief, enables merchants to accept EVM card payments and conduct sales analytics via a mobile device that runs on iOS or Android, and is connected to a so-called Lite card reader. iZettle sales started in August 2011 in its hometown of Sweden, then rapidly spread to the vicinal areas of Denmark, Finland and Norway in early 2012. (Crunchbase - iZettle 2015, iZettle 2015a).

FIGURE 26. An iZettle package for iOS (iZettle 2015a).

a. Future goals

As a newly-established startup, iZettle sets its immediate goal to accumulate as much capital as possible, through both channels of sales and external financing, in order to first improve its credit ratings, and to further on expand its operation. In 2015, the company completed its series D funding round, through which it has raised a total of 61 million EUR, majorly from Intel and Zouk capital. This could imply that in the upcoming period, most of iZettle's effort is directed to boost up its sales globally. In

fact, the Swedish company has already put this into progress with new inbound orders coming from Italy, Mexico and Brazil. (Bloomberg Business 2015, iZettle 2015a.) In a longer run, according to iZettle CEO Jacob de Geer (2015), the company projects to expand principally in Europe and achieve its benchmark in Sweden of owning more than 50% of the aggregate number of payment terminals.

b. Organization

iZettle's organization is still at its pristine phase of development with the company operating as a team under the supervision of CEO Jacob de Geer. It is rather inferable from the company's human resources approach that at this point, iZettle is emphasizing on developing and refining the technological aspect of its product. Fifty out of the company's 200 employees are related to application development and its future recruitment of technologists accounts for over 60% of the company's open vacancies. On the counterpart, the business segment of iZettle is primarily steered by its CEO Jacob de Geer and COO Magnus Nilsson – the two experienced businessmen who have had experiences founding and managing several businesses namely Wctiies Inc, Ameibo and Tre Kronor Media. (iZettle 2015b, Nilsson 2015, Geer 2015.)

c. Assumptions

The Swedish company holds quite a positive outlook for the future growth of the payment industry, especially within the small-scale retailing section. Its CEO Jacob de Geer, based merely on the profitability records of iZettle, firmly believes that the payment market is "monstrous yet hugely underserved" and expects nothing less than "an exponential growth" from the current 3-billion-EUR-total-sales state of the market (Bloomberg Business 2015). This optimism from iZettle could hint a two-fold implication: first, the company is confident about the competitiveness of its unique selling point: to facilitate chip card payments anywhere, anytime; and second, it is oriented to circumvent competition, at least for this phase of development (The Paypers 2011).

d. Current strategies

It is fairly recognizable that iZettle's current strategies are devised in alignment with its stature as a newly-founded business. Technology-wise, the company has been investing immensely to both advance the functionality of its current offering, and to further enrich its one-single-offer portfolio by other innovative products and services. So far, the Swedish company has harvested some initial results from this strategy with the rollout the NFC and Apple-pay compatible payment terminal in May 2015 (ready for mass sales in December 2015). (iZettle 2015c.) Business-wise, iZettle is putting substantial priority on erecting partnerships with other companies in its value chain. This approach is adopted in view of expanding the company's current customer base, whilst simultaneously supplementing the shortcomings of its product. In 2012, shortly after its sales commencement in Denmark, Finland and Norway, the Swedish company partnered with Nordea to give free card readers to small and medium-sized businesses in Sweden, thereby gained access to a huge number of merchant accounts (Nordea 2012). In 2013, the company announced collaboration with Xero accounting application, followed by a partnership with Vend POS in 2015, which together enable iZettle to offer its customers a full-stack system from inventory management, sales analytics to payment processing (Vend 2015, Xero 2013)

e. Preliminary verdict for iZettle

iZettle, at this very phase of development, can be referred as a short-run sprinter, i.e. the company prominently accentuates on approaches which generate decent profit in short payback period with low risk involved. This conclusion is well-evidenced by the implications of certain aspects that have been analyzed above, namely short-term future goals, positive assumptions, and a partnership-oriented business strategy. Concerning competition, the Swedish company is temporarily inclined to elude as much inimical rivalry as possible so as to maximize its potential profitability. Yet upon the encounter of unwanted competition from dominant incumbents, the author speculates that iZettle shall tilt to the

approach of being acquired rather than the alternative of raising more capital (from either venture capitalists or the company's IPO) to directly engage in the combat.

5.2.2.4 Square

Square is an American, San Francisco-based merchant services aggregator who primarily provides retailers with innovative mobile payment solutions and devices along with augmented sales, analytics and marketing functionalities (Square 2015).

FIGURE 27. Square mobile payment application and a Square stripe card reader (Square 2015).

a. Future goals

At this point, Square is principally servicing the areas of North America, Japan and Australia, however it aims to go further on a global scale in no time. According to the Telegraph (2013), Square's CEO Jack Dorsey intimates that the company's vision is firmly defined as to become a major international player as rapidly as possible. This goal has been constantly transferred into action over the past triennium with vigorous capital-raising and preparatory conducts such as $250 million external financing in 2014, undisclosed private equity financing in 2015 and the company's IPO in November 2015 (CrunchBase - Square 2015).

b. Organization

With regards to organizational aspects, there are two notable highlights in the management tier of Square that, to a degree, might imply the company's strategic approach. First, in reference to the Hardware lead position, Jesse Dorogusker is currently taking the responsibility to oversee the design, cross-engineering, manufacturing and operation of Square products. Appointing a technological adept who owns a high-profile experience as the Director of Engineering for Apple's iPhone, iPad, and iPod Accessories business like Dorogusker to be chief technical supervisor could imply Square's weighty emphasis on advancing its technological competency. Second, concerning the Capital lead position, Jackie Reses is presently in power. Her previous occupations as Yahoo's Chief Development Officer on Partnerships and Acquisitions, and member of the Board of Director at Alibaba Group are solid indications of Square's critical accentuation on issues involving capital. (Square 2015.)

c. Current strategies

One of the most salient strategies that Square is currently employing is to invest substantially in technology to better meet the needs and requirements of its small-business customers. This approach is implemented under the rationale to ameliorate the company's customer relationships, thereby create a sturdy platform for its expansion plan to take off. Square commenced this strategy quite a while ago when the American company first introduced its customer loyalty punchcard program – a feature needed by ample merchants, in 2012; and up till now, it has continuously progressed the strategy to additionally provide customers with in-depth analytics, tax preparation, and inventory management add-ons. Most recently, Square has re-announced its commitment to help small-business customers by informing the introduction of a new chip-friendly card reader that shall facilitate retailers in the shift from magnetic swipe cards to EMV cards in late 2015. (Isaac 2014.)

d. Preliminary verdict for Square

Based on superficial deduction, the author speculates that Square entering the European market (including Finland) and becoming a major contender is quite far-fetched future. This is fundamentally due to the apparent chasm between the European and American payment landscape and the intense awaiting competition from entrenched European incumbents such as iZettle, Payleven, Sumup (Mundy 2014).

5.2.2.5 Zwipe

Zwipe, a fresh Norwegian tech-startup, is one of the world's leading pioneers to apply biometric authorization into payment processing. The company was established in 2009 and no later than 2014, it started to globally launch its product of the Zwipe MasterCard – a specially-engineered credit card with a capacitive touch sensor that enables users to authenticate themselves with their fingerprints to conduct contactless payments. (Zwipe 2015a.)

FIGURE 28. Zwipe MasterCard (Zwipe 2015a).

a. Future goals

In the position of a breakthrough innovationist, Zwipe strategically defines its immediate future goals as to actively rack up sales and to further expand its market to a ubiquitous level. As much extravagant as this might seem, the Norwegian company, however appears to be ardently committed to these erected objectives, which is due to two anticipated

reasons. First, the company has been experiencing way-beyond-forecast demand for its offering with orders inpouring from resellers and integrators in the US, Europe, Middle East, Russia, Africa and Mexico (Zwipe 2015b). Second, it wants to promptly take advantage of the newfangled, rapidly-progressing biometric market before any significant contender emerges (FindBiometrics 2015).

b. Organization

The organization of Zwipe has recently witnessed notable amendment with the hire of Louis Bianchin – a payment industry veteran, as its Director of Strategic Alliances in October 2015. Bianchin's expertise in market analysis and business development along with his 10-year experience and networking in payment technology are speculated to benefit Zwipe immensely both in creating strategic partnerships and enlarging the company's market in a profitable way. (Zwipe 2015c.)

c. Current strategies

Zwipe's current strategies are devised in intimate cohesion with its pre-defined goals, i.e. the company is guided to operate with focus on expanding its market and increasing sales. In specific, Zwipe has been establishing several partnerships that facilitate the company in moving towards the goal-line. In October 2014, Zwipe partnered with MasterCard to co-launch the world's first biometric contactless payment card (MasterCard 2014). This collaboration allows Zwipe to tap into the widespread customer base of MasterCard, thus directly increasing the company's global presence. In early 2015, the Norwegian company took another significant step by partnering with Danske Bank to specifically pilot its product to Northern European merchants (Zwipe 2015c). Aside from partnerships, Zwipe has also been vigorously utilizing media as a core means to spread information about its technology globally, thereby indirectly generating interest from banks and retailers. The company was filmed by BBC and CNN, and got featured on over 1,100 pieces of coverage in all five continents, which together resulted in an aggregate of approximately 410 leads from customers worldwide. (MagnaCarta 2015)

d. Preliminary verdict for Zwipe

On the contrary of Square's, Zwipe's probability to enter the Finnish market, gauged based on the above breakdown, is rather transpicuous. The author believes the fact that Finland shares similar business settings with Norway along with Zwipe's partnership with Danske Bank are two sound stepping stones for the Norwegian company to penetrate into the payment industry of Finland in a near future.

5.2.2.6 Capabilities of competitors

In this sub-section, the author shall conduct a quantitative evaluation of the above representatives' capabilities in furtherance of assessing the severity of their future impacts. Table 5 demonstrates the results in detail.

TABLE 5. Capabilities of Competitors from Uniqul's Point of View
(Scale from 1 to 5 with 1 being very weak and 5 being very strong)

Competitors / **Criteria** (Weight)	**Verifone**	**Nets**	**iZettle**	**Square**	**Zwipe**
Immediacy of impacts (0.05)	4	5	3	0	3
Technology (0.25)	4	4	3	3	5
Finance (0.25)	5	5	3	4	2
Supply Chain Network (0.25)	5	5	3	3.5	4
Brand Recognition (0.10)	5	4.5	4	4	2
Human Resources (0.10)	5	5	3	4	3.5
Total	4.7	4.7	3.1	3.425	3.45

As can be seen, the tabulated evaluation are constructed based on five criteria (technology, finance, supply chain network, brand recognition and human resources) which the author tentatively considers as the most

critical factors in the payment industry. These criteria are additionally assigned with specific weight points that corresponds with their relative importance in determining the competitiveness of a payment processors. To elaborate, the author subjectively assumes the three most influential factors in the payment industry are technology, finance and supply chain network, hence assigns a 0.25 weight point to each of those, whereas allocates 0.10 to brand recognition and human resources. In auxiliary, the author allots a 0.05 to an extra criteria of “immediacy of impacts” which, from the standpoint of Uniqul, could extensively amplify the capabilities of contenders.

The results harvested clearly denote that Nets and Verifone are the two incumbents who possess the most significant capabilities to impact Uniqul face recognition payment application, with the total points of 4.7/5. This is essentially owing to their copious financial resources, expansive supply chain network and widespread brand recognition.

5.3 Chapter 5 summary and final verdict

This chapter principally aims to provide a thorough answer to sub-research question

Q2. *How intense is the competition in the Finnish payment industry that Uniqul has to face?*

The author has therefore tackled this issue from both a general scope of the Finnish payment industry analysis and a specific level of individual competitor scrutiny. In brief, there are two key takeaways that should be borne in mind:

First, the Finnish payment processing industry is at a medium level in terms of competition intensity, however it does possess a rather high entry barrier conjoined with certain probability of retaliations from entrenched incumbents, which might create some definite impediments for Uniqul to deploy its product.

Second, specifically regarding the acts of retaliation from contenders, it is inferable from the prior competitor analyses that Nets holds the most potential to respond to Uniqul deployment, which is likely to be in the form of acquisition. In a longer run, if Uniqul face recognition payment application takes off, Verifone is expected to be the ensuing contestant to commence an act against Uniqul. This, nevertheless, might be a technological race from the American company to develop a similar or even superior application.

6 FINNISH CUSTOMER ANALYSIS

Chapter 6 aims to supplement Chapter 5's study of the microeconomic dimension by carrying out an in-depth examination of Finnish customers within the grocery retailing market – the segment that plays a determining role in the success of Uniqul deployment. As previously stated in sub-chapter 2.5, the author shall separately investigate two subsets of the Finnish customers, i.e.:

Sub-chapter 6.1: Grocery retailer analysis

Sub-chapter 6.2: End user analysis

The investigations shall be conducted based primarily on data collated from internet survey and interviews. However, in contemplation of a more reliable outcome, ethnographic records will also be used in parallel.

By the end of this chapter, readers can allegedly gain certain knowledge to assess the potential demand of the Finnish market for Uniqul face recognition payment application.

6.1 Grocery retailer analysis

This sub-chapter is favored as the kernel of Chapter 6 due to the fact that grocery retailers are direct buyers and initial adopters of Uniqul face recognition payment application. Despite having recognized the utter importance of this subset, the author still can only provide a sectional scrutiny of it by causes of time restriction, data shortage and language barrier.

6.1.1 Segmentation of grocery retailers

Within the scope of this analysis, the author pursues the simple approach of segmenting grocery retailers by size of store. This approach is chosen under the justification that it satisfies the four criteria for a strategically effective segmentation, namely:

- Measurable: the number of grocery retailers in each segment, i.e. the size of each segment, is attainable.
- Accessible: the author is able to conveniently reach and investigate each of these segments since grocery retailers of all size can be found in the author's residing area of the Capital Region.
- Sustainable: the segments are decent in size and profitability for Uniqul to focus on.
- Responsible: the characteristics of each segment are distinguished from those of the others, hence their perceptions about Uniqul's values diversify e.g. a segment might appreciate Uniqul's benefit of reducing the queue lines while another is interested in Uniqul's "fancy" technology that could attract more customers to store.

Table 6 delineates the segmentation of grocery retailers in Finland in detail, conjoined with data collection method for each segment.

TABLE 6. Segmentation of grocery retailers in Finland and data collection method (Finnish Grocery Trade Association 2015).

Criteria / **Segments**	**Definition**	**Components**	**Data Collection Method**	
			Data sources	**Timeframe**
Hypermarkets and supermarkets	Business area > 400 m2	K- Citymarket, Prisma, Minimani, Lidl, K-Supermarket, etc	Semi-structured interview with K-Citymarket Paavola Retailer Marko Laaksonen	29/12/2015
			Ethnography at Lidl Kamppi Helsinki, K-	01/12/2015

			Citymarket Paavola Lahti	– 30/12/2015
Convenience stores	Business area: 100 – 400 m2	Valintatalo, Siwa, etc.	N/A	N/A
			Ethnography at Siwa Lahti	01/12/2015 – 30/12/2015
Individual small stores and specialty markets	Business area < 200 m2 and does not operate in a chain	Aseanic, Vivoan	Semi-structured interview with Mr. X – Store Manager of an Asian specialty deli	07/01/2016
			Ethnography at Viivoan, Helsinki	12/12/2015

6.1.2 Grocery retailer unmet needs and motivations

As mentioned in prior, the analysis of grocery retailer unmet needs and motivations is rendered on the grounds of interviews with grocery store managers and ethnographic observations at several stores. This section, therefore shall first brief through the interview questions and ethnography's objectives before further delving into the harvested results.

6.1.2.1 Interview questions and ethnography's objectives

a. Interview questions

The set of interview questions is composed in a semi-structured approach, which enables the author to partially improvise in line with the

interviewee's answers and thereby elicit more information and fortuitous ideas (Zikmund 2003). In the first part of the interviews, the author aims to identify the unmet needs of grocery retailers that relate to payment processing. This, hence takes into account the basic matters of queueing line, customer retention and targeting conducts, employee training process, and frauds. The latter part of the interviews is designed to unveil the current and probable motivations for grocery retailers to adopt Uniqul face recognition payment application. This means, the author shall steer the interviews in pursuance of identifying the intensity of the grocery retailer unmet needs, external triggers as well as dissatisfiers that impede grocery retailers from purchasing Uniqul's application.

b. Ethnography's objectives

Ethnography, in this context, projects to limitedly verify the accuracy and supplement the deficiencies of the interview results. The author plans to conduct ethnographic observations at several stores in Helsinki and Lahti during the whole month of December 2015. The extensive observation timeframe and location are expected to provide the analysis with a just and holistic picture of grocery retailer unmet needs and motivations.

6.1.2.2 Interview and ethnography results

Within this sub-section, information assembled from interviews and ethnography shall be analyzed in correspondence with the three defined segments of grocery retailers rather than on a general level. This approach, in a way, helps the author prevent overgeneralized findings whilst generates specific insight into the unmet needs and motivations of different grocery retailer groups.

a. Hypermarkets and supermarkets segment

Hypermarkets and supermarkets are grocery retailing stores with commercial area larger than 400 square meters. In Finland, hypermarkets and supermarkets are the most prevalent models of grocery retailing, which accumulate over 77% of the total grocery sales nationwide. Within

this segment, there are three predominant players that reign the market, namely S-Group (45.7% of market share), Kesko Group (33.1% of market share), and Lidl (9.2% of market share). (Finnish Grocery Trade Association 2015.) The interview with Mr. Laaksonen, retailer of K-citymarket Paavola Lahti along with ethnographic observations at K-citymarket Paavola Lahti and Lidl Kamppi Helsinki shall representatively reveal the unmet needs and motivations for adoption of this grocery retailer segment.

First, concerning unmet needs, most hypermarkets and supermarkets in Finland, according to Mr. Laaksonen, generally do not identify immense severity of matters related to queueing line, cashier training or payment card frauds, whereas would consider customer retention and target marketing through payment system as a highly exploitable and improvable section.

In terms of queueing line, since it has long emerged as a central issue, hypermarkets and supermarkets have already been putting decent efforts into maintaining the queues at a satisfactory level. Apart from allotting a Customer Service Manager in store to flexibly regulate cashiers and oversee the servicing process, hypermarkets and supermarkets additionally have an internal alarm system installed to alert and resolve unanticipated customer capacity overload. Cashier training and payment card frauds, akin to the matter of queue line, are essentially not seen as unmet needs by this grocery retailer segment. As shared by Mr. Laaksonen, cashier training in hypermarkets and supermarkets does not take up longer than a day, whilst payment card frauds rarely occur and are technically not grocery retailers' responsibility.

On the flip side of the coin, customer retention and target marketing through the channel of payment system are regarded by hypermarkets and supermarkets as an underdeveloped section which could be markedly improved. This is owing to the fact that, at this point, most of these customer-oriented strategies are merely practiced in the forms of discount and rebate campaigns via loyalty cards (K Plussa for Kesko Group and S

Bonus for S-Group). Mr. Laaksonen further intimates that the hindrance to implementing individual-level customer relationship management is majorly attributed to customer data being fragmentally owned by payment service provider and loyalty cards company (e.g. K-Plus Oy).

With reference to ethnography, the result, in the main, approves the above-spotted unmet need of hypermarkets and supermarkets, yet supplements that queueing line, to a narrow extent of stores in the Capital Region, is also an unsatisfied need. This finding is based on the author's observation at Lidl Kamppi Helsinki. In 12 days of observation from 11 December 2015 to 22 December 2015, the author constantly noticed an overload scenario at the store during afternoon hours, even though all sales counters were put into full function. The queueing line overextended up to 5 meters from the counter and it took approximately 8 minutes for a shopper to get checked out from the back of the queue.

Second, respecting motivations for adoption, the interview with Mr. Laaksonen exposes three forces that could cogently trigger hypermarkets and supermarkets to purchase Uniqul face recognition payment application. The first one relates to the external factor of customers. Mr. Laaksonen states that since customer satisfaction stands as a top-notch priority for most, if not all, large-sized grocery retailers, it is very likely for hypermarkets and supermarkets to adopt a new payment system if they continually receive a great deal of either complains about the existing system or referrals to new solutions from shoppers. The second force refers to the drive from competitors. As the Finnish grocery retailing market exists relatively in the form of an oligopoly, an action of technology adoption from a core player is prone to shortly lead to a chain reaction from other major players in order to maintain the comparative competitiveness in the market. In particular, according to Mr. Laaksonen, K-citymarket shall promptly consider purchasing Uniqul application in the circumstance that S-Prisma has taken a step in the adoption process. The last force that motivates hypermarkets and supermarkets to adopt Uniqul application is denoted by Mr. Laaksonen as supplier push. This means, if the current payment service provider of hypermarkets and supermarkets

recommends the integration of Uniqul application into the extant functioning payment system, the adoption decision is more plausible to be made.

Aside from motivators, the interview concurrently unfolds three most notable dissatisfiers that impede hypermarkets and supermarkets from adopting Uniqul application. The first barricade involves the decision process for acquisition. In consonance with Mr. Laaksonen's sharing, the actual course of purchasing and installing Uniqul face recognition payment application system into a hypermarket or supermarket is a complex and time-consuming process which requires the consensus of three parties: Uniqul, Kesko Group and the retailer of the hypermarket or supermarket. More often than not, this process might take up to over a year. The second dissatisfier is indicated as utility skepticism. Mr. Laaksonen asserts that the unproven functionality, security, and profitablity of Uniqul application could possibly held decision makers of hypermarkets and supermarkets stranded in reluctance and could eventually lead to disapproval. He, however suggests that a piloting session at hypermarkets and supermarkets to substantiate the worthiness of acquiring Uniqul application is utterly possible. The third factor that might hinder the adoption is disclosed to be Uniqul's feature of top-up account. From Mr. Laaksonen's perspective of a retailer, the requisite coexistence of two payment systems, Uniqul and the conventional payment card processor, is a huge drawback that could discourage hypermarkets and supermarkets from acquiring Uniqul application. This is speculated to be due to the probable complexities in data management, counter installation and customer servicing.

b. Convenience stores segment

Convenience stores refer to grocery retailing stores with commercial area from 100 to 400 square meters. In Finland, Suomen Lahikauppa owns the majority of these convenience stores (661 stores) with its two renowned chains of Siwa and Valintatalo (Finnish Grocery Trade Association 2015.) In the scope of this grocery retailer segment analysis, the author can only

limitedly reveal the aspect of unmet needs in a speculative manner as for the fact that data are merely collected from ethnographic observation at a small Siwa store in Lahti.

By and large, convenience stores are identified to be in minor need to resolve the matter of queueing line. Ethnography exposes that queues at convenience stores are, most of the time, insignificant. In 30 days of observation at Siwa, the author noticed only 7 days of slight congestion (23% of total time), which entirely fell into Sundays and national holidays (i.e. Independence Day and Christmas). The one need of convenience stores that emerged during the ethnographic session was related to customer retention conducts, particularly the loyalty program. From the observation at Siwa, the author acknowledged that, despite the efforts put in promoting the PINS loyalty program via banners and cashiers' recommendations, Siwa marginally failed to engage customers into the program (only 5 out of 50 observed shoppers, i.e. 10%, signed up and used the PINS card). Hence, this could be seen as a feasible section for Uniqul application to tackle.

c. Individual small stores and specialty markets segment

This is the third and last segment of grocery retailers which encompasses private stores with commercial area less than 200 square meters. According to the Finnish Grocery Trade Association (2015), there are around 1100 grocery retailing stores of this segment in Finland, accounting for 1.3% of the total market share. In order to unveil the unmet needs and motivations for adoption of these individual stores and specialty markets, the author shall harness the information harvested from a short interview with Mr. X, store manager of an Asian specialty deli as well as from observation at Viivoan Asian Market, Helsinki.

Regarding unmet needs, the interview with Mr. X suggests a substantial satisfaction level of the owner with the store's current operation. This could be inferred that there barely exists any considerable need of this grocery retailer segment in connection with queueing line, payment frauds, cashier training or customer retention strategy. Mr. X explicates that, as his

business operates on a small scale with a single outlet, there is principally no point in adopting an advanced payment technology with “extravagant” features. Ethnographic result at Viivoan Asian Market fundamentally corroborates the above finding from the interview. While the queue lines were observed to be constantly maintained at an acceptable level with two sales counters (average of 6 people per queue), on the other aspect of customer retention, the author detected that the efforts to retain customers were efficiently conducted in the forms of networking and spontaneous discounts for regular customers.

Since no significant unmet needs were identified from this grocery retailer segment, the author deliberately diverted the interview questions to reveal motivations for adoption to instead exploit the interviewee’s subjective judgments on dissatisfying features of Uniqul application as well as possible additional features that could prompt individual small stores and specialty markets to reconsider the decision for adoption. The result unfolds two core ideas. First, the markup charged by Uniqul on top of the regular payment card fee is seen as a weighty dissatisfier which could discourage individual small stores and specialty markets from acquiring the application. On this matter, Mr. X explains that the general small profit margin (roughly 2%-3%) of this grocery retailer segment is the prime reason that engenders the inclination to minimize costs on all accounts as much as possible. Hence, unless the markup by Uniqul entails visible profitability, most retailers of this segment shall not consider the application as a tempting offer. The second idea of Mr. X involves possible additional features for Uniqul application. He recommends integrating Uniqul payment application to a full-stack POS system that offers inventory management functionality. This suggestion lays its rationale on the fact that, according to Mr. X, most individual small stores and specialty markets are controlling their inventory quite ineffectively by paper and pencil.

6.2 End user analysis

End users, though being positioned inferior in importance, still stand to be a critical factor that determines the successfulness of Uniqul’s launch. Not

only do these users contribute a considerable proportion in Uniqul's revenue stream, but they also serve as motivators that incite retailers to adopt Uniqul face recognition payment application. Having acknowledged the sizeable influences of this customer sub-segment, the author shall put accent on analyzing its unsatisfied needs as well as motives for adoption in this very sub-chapter.

Data utilized in the analysis are curated from an internet survey published by the author from 27 November 2015 to 14 December 2015. The survey was spread to the target respondent group of shoppers in Finland via social media channel (i.e. Facebook) and online shopping forums. In total, 514 participants took part in the online survey yet only 357 managed to complete it legitimately. So as to offset the obvious lack of respondent diversity of this survey, the author shall also harness data from the ethnographic observations mentioned in sub-section 6.1.2.1b in the analysis.

6.2.1 Survey questionnaire

The online survey questionnaire is constructed with three layers of questions. The first one includes queries that aim to identify the respondents' biographical background, namely age, gender, income level and place of residence in Finland. The second layer examines their payment and shopping habits while the third focuses on eliciting their opinions about the notable features of Uniqul face recognition payment application. The author devises the survey in a slightly humoristic manner, which is essentially for the sake of increasing participants' interest in doing survey, hence further spreading the survey out.

6.2.2 Survey analysis and ethnography results

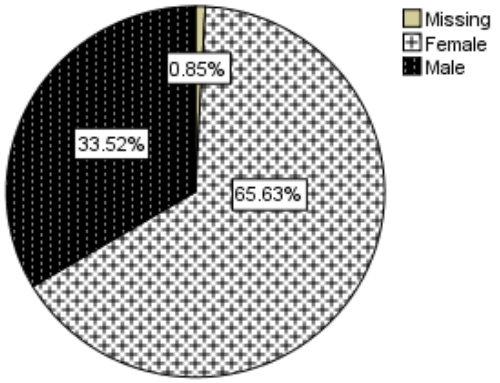
Data harvested from the online survey questionnaire are briefly processed with IBM SPSS Statistics 20 and are subsequently analyzed together with ethnography results in three themes corresponding with the three layers of questions:

a. Sample description – layer 1: biographical background

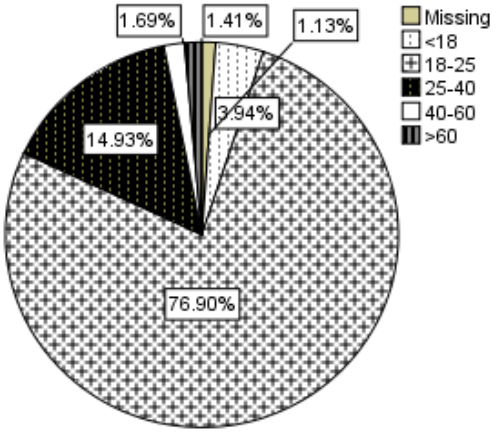
b. End user unmet needs – layer 2: payment and shopping habits

c. End user motivation – layer 3: new product testing

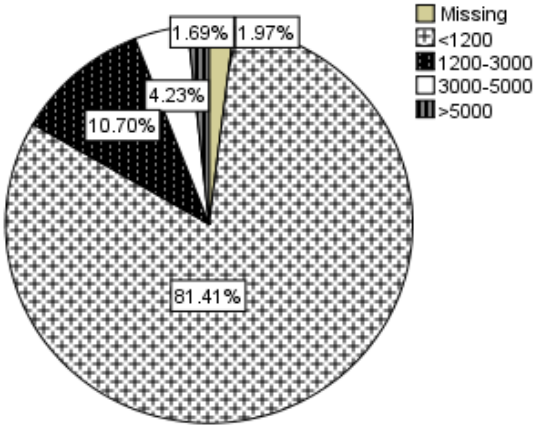
a. Sample description



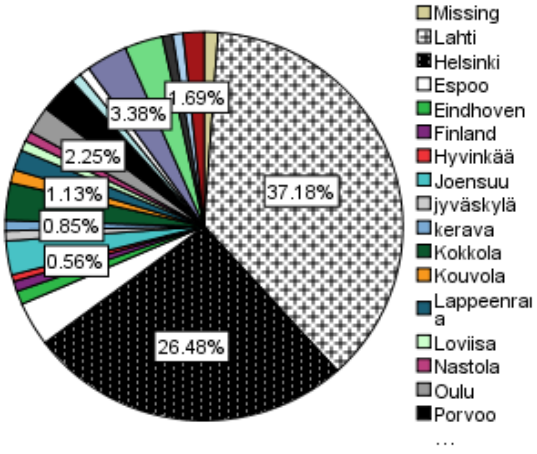
Gender



Age Groups



Disposable Income (EUR)



Place of Residence

FIGURE 29. Biographical background of respondents (n=357)

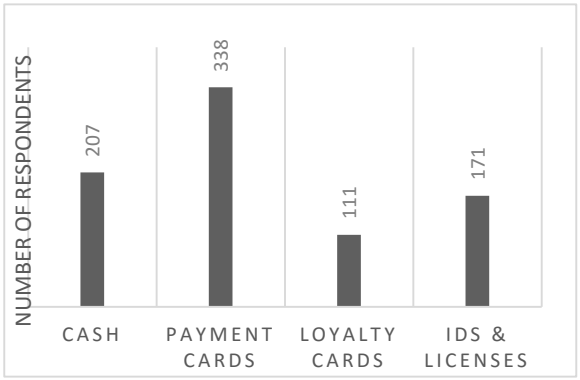
Figure 29 is a synopsis of the biographical background of 357 legitimate respondents in terms of gender, age, disposable income and place of residence. It is fairly observable that the majority of respondents are females (65.63%), young adults from 18 to 25 years old (76.90%), and belong to the low income bracket (over 81.41% have monthly disposable income less than 1200 Euros). This surveyed population could be seen as

unrepresentative for the Finnish population due to the fact that only 50.85% of people residing in Finland are females, 11.8% are young adults, and low-income inhabitants account for as few as 13% of the population (Statistics Finland 2014). Nonetheless, data collated from these respondents still prove a substantial value for Uniqul deployment strategy since they provide certain understandings about Uniqul's target customer segment of young adults living in the Capital Region (approximately 24.9% of respondents are young adults living in Helsinki and Espoo) (Pisarenko 2015).

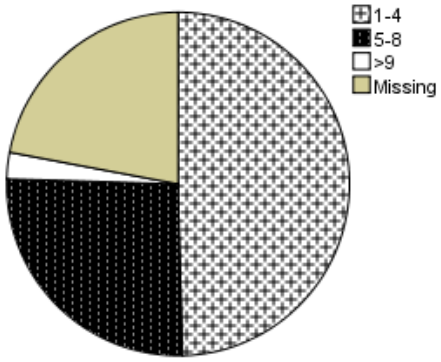
b. End user unmet needs

Since this theme is a keynote of this sub-chapter, the author attempts to orderly scrutinize all questions within layer 2 in the interest of gaining a decently-thorough insight into end users' unsatisfied needs. In case deficiencies of survey data arise, the author shall search for supplementary from ethnographic observations.

The first and second question in layer 2 investigates users' core and augmented means of payment through inquiries about the components of their wallet and the quantity of cards they possess. Figure 30 provides a visual summary of the results.



Components of Wallet



Quantity of Cards

Figure 30. Users' core and augmented means of payment

According to the bar chart, 338 out of 357, i.e. 94.7% of the respondents keep payment cards in their wallet while only 58% bring cash, 31% bring loyalty cards 48% bring IDs and licenses. This could first indicate that the major means of payment among the surveyed population is payment cards, and second suggest that loyalty cards as well as IDs and licenses are not that prevalently used in grocery shopping. In auxiliary, based on Pearson Chi-square and correlation tests (appendix 2), the author also figures out that there exists a small positive correlation ($r = 0.161$) between age groups and loyalty cards ($p < 0.05$). This basically means that older people tend to use loyalty cards slightly more than younger generations. Regarding the quantity of cards possessed by respondents, the pie chart clearly shows that most shoppers in Finland have fewer than 8 cards of all types (at approximately 75%). This, nevertheless is not significantly correlated to either age groups, gender or income level ($p > 0.05$).

From the point of view of ethnography, the general idea about users' preferences of the payment means is similar to the survey findings, yet the degrees of usage of these means are disparate. Among 350 shoppers that were observed, only 35 used cash (10%), 81 used loyalty cards (23.1%) while a mass of 315 used payment cards (90%). The author also noticed

that most cash and loyalty card users were senior females who are seemingly above 50 (at 75% and 71% respectively).

In the next set of three questions, participants are probed about their shopping habits, particularly shopping frequency, shopping location changes and basket value. The results are demonstrated in the figures below.

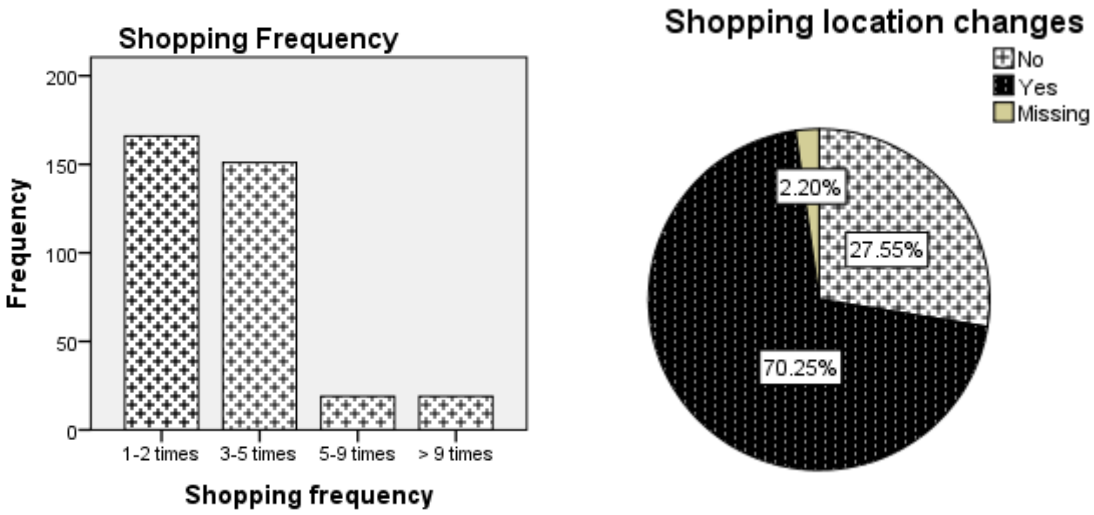


FIGURE 31. Users' grocery shopping frequency and shopping location changes

It appears to be rather apparent from the above graphs that a dominant proportion of respondents goes for grocery shopping less than 5 times a week (88.8% of respondents) and drops by different grocery retailing stores during their shopping session (70.25% of respondents). The author additionally unveils that within this surveyed population, there seems to be no significant correlations between age groups, disposable income and shopping frequency as well as shopping location changes ($p > 0.05$).

Figure 32 displays the outcome for the remaining inquiry about users' basket value.

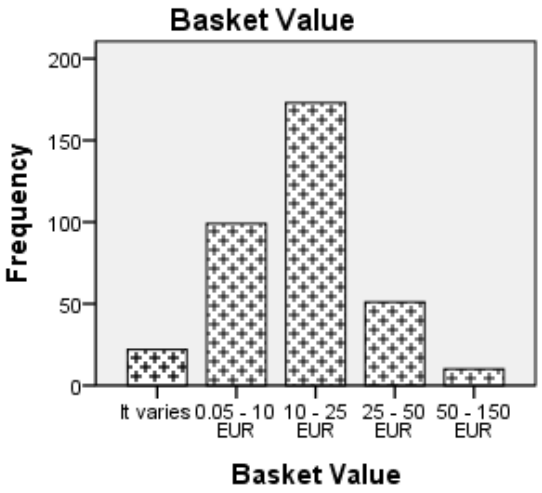


FIGURE 32. Users' basket value

The above bar chart recapitulates the distribution of user basket value, with the vertical axis showing the number of respondents and the horizontal axis showing the basket value groups. It can clearly be seen that the basket value of respondents hovers majorly within the 0.05 – 10 Euros group and 10 – 25 Euros group (at 27.9% and 48.7% of the total responses respectively). In order to gain an augmented understanding about these purchasing values, the author attempts to further explore any existing correlation between basket value and the two other variables of age groups and disposable income, hence Pearson Chi-square tests and Pearson correlation tests are run (appendix 3). The results reveal that there occur medium positive correlations both between age groups and basket value ($r = 0.351$) and between disposable income and basket value ($r = 0.331$) ($p < 0.01$). These revelations could be tentatively interpreted into the fact that older people and the more affluent class are more likely to have higher basket value.

The ensuing question is meant to judge respondents' familiarity with high technology payment methods, the cluster to which Uniqul face recognition payment application belongs.

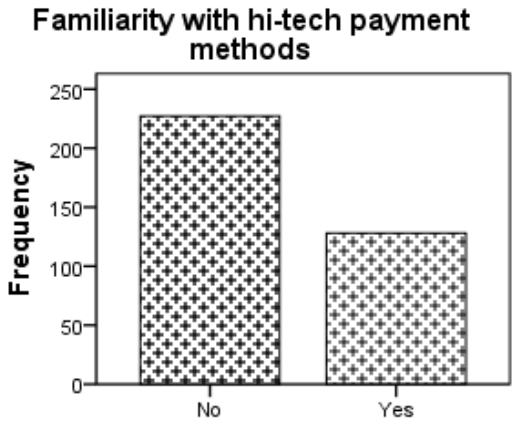


FIGURE 33. Users' familiarity with high technology payment methods

Based on Figure 33 bar chart, it is inferable that most respondents have a limited knowledge about advance payment technologies, even those that are becoming more prevalent e.g. NFC, Visa Paywave (63.9% of respondents answering "No"). In a keener scrutiny, the author realizes that people with higher disposable income, however are inclined to be marginally more acquainted to these high technology payment methods (a small correlation with $r = 0.294$, $p < 0.01$).

The last four questions of layer 2 target to elicit respondents' opinion about four fundamental aspects of their current payment methods, which are security, convenience, speed of payment, and accuracy. The outcomes are recorded on the scale from 1 to 5 with 1 being 'very unsatisfied', 3 being 'neutral' and 5 being 'highly satisfied', delineated as in the figure below.

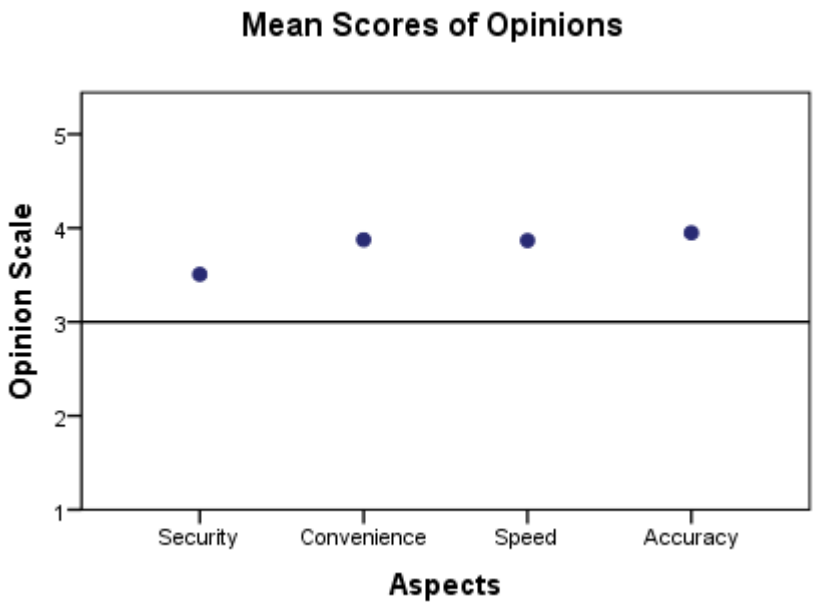


FIGURE 34. Mean score of respondents' opinions on four aspects: security, convenience, speed, and accuracy

According to the dot graph, most respondents maintain a fairly content attitude towards all four aspects of their current payment methods, particularly at the mean score of 3.51, 3.88, 3.87, and 3.95 for security, convenience, speed and accuracy respectively. Despite the relative equivalence in satisfaction among the four aspects, it is apparently noticeable that security suffers more skepticism than others, with almost 40% of respondents claiming that they are only at a moderate level of confidence about security measures of their payment methods. The author additionally finds out that users from lower income bracket appear to be more perturbed about this issue than those with higher net income (correlation between disposable income and security satisfaction: $r = 0.118$, $p < 0.05$). Another striking feature of the outcomes is related to the aspect of accuracy. However high the mean score of users' opinions about accuracy is (3.95/5), an unusually notable proportion of respondents

(6.2%) complains about the annoying occurrences of payment glitch. It is disclosed that most of these dissatisfactions are documented from age groups under 25, which could be translated to the fact that younger people are less tolerant of malfunctions than older ones (correlation between age groups and accuracy satisfaction: $r = 0.149$, $p < 0.01$).

Ethnographic findings further contribute to the elaboration of users' opinion specifically towards the aspect of convenience. Even though the survey has recorded an upper medium level of satisfaction, at the mean of 3.88, from respondents, observations at several grocery retailing stores in Helsinki and Lahti reveal that most shoppers possess an unarticulated need to ameliorate the convenience of their payment methods. The author observed 90 out of 350 shoppers having to carry an uncomfortably thick wallet or purse, stuffed with bills, cards and cash during their shopping session, along with 80 people using a cellphone wallet case to store their cards. This could partially indicate that grocery buyers are implicitly in need of a more convenient way of payment.

c. End user motivation

This theme is a second keynote of this sub-chapter and is studied based on twelve questions of layer 3. As previously mentioned, layer 3 questions principally concern the issue of new product testing, which, in particular, inquires respondents to gauge their "affinity" towards Uniqul face recognition payment application and thereby unveils the product's features that could trigger adoption. Figure 35 summarizes the mean values of respondents' opinions on the scale from 1 to 5, with 1 being "not interested", 3 being "neutral", and 5 being "very interested".

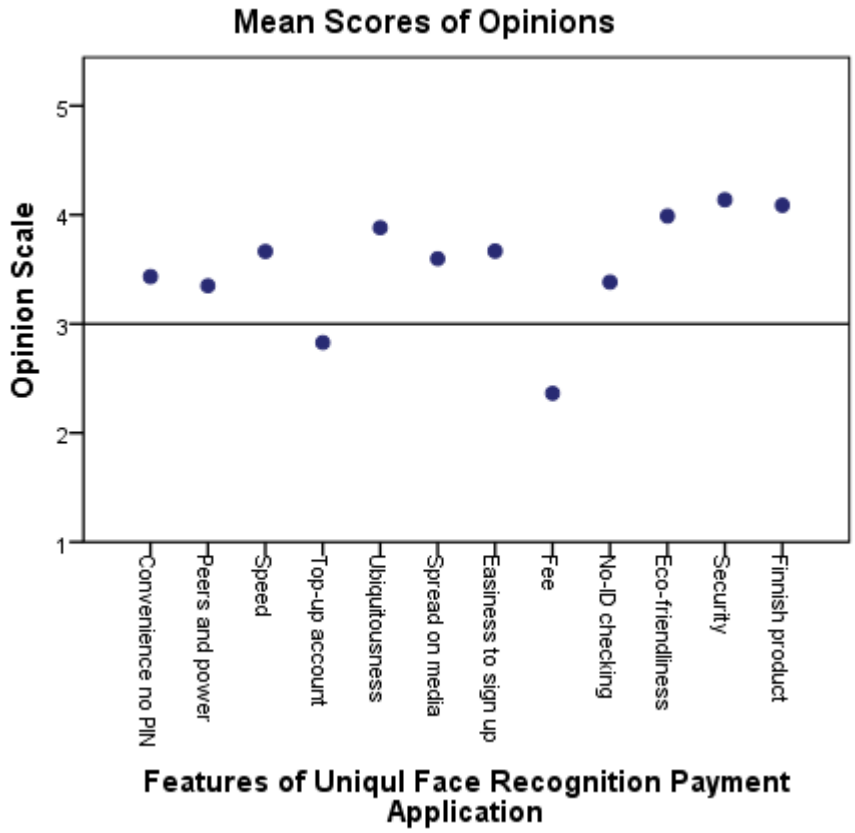


FIGURE 35. Mean scores of respondents' opinions on twelve features of Uniqul face recognition payment application

From a panoramic view, it is perceptible that all advantageous features of Uniqul application (convenience, peers and power, speed, ubiquitousness, spread of media, easiness to sign up, no ID-checking, eco-friendliness, security and Finnish product) receive above-neutral preference from respondents while two drawbacks of the product (top-up account and monthly fee) are just slightly disfavored.

A closer look into the dot graph exposes that there exist three distinctive levels of preference for the ten advantageous features of Uniqul application, which are: below the mean score of 3.45 (convenience, peers and power, no ID-checking), from 3.45 to 3.85 (speed, spread on media, easiness to sign up), and above 3.85 (ubiquitousness, eco-friendliness, security, Finnish product). Among the lowest tier, the presence of Uniqul's core competency of convenience, at the mean score of 3.43, is astoundingly unanticipated. The author, however could not find any

significant correlations between respondents' rating for this feature and their biographical background ($p > 0.05$). The medium tier of preference highlights the appearance of another unique selling point of Uniqul, i.e. speed, at the mean score of 3.66. The reason behind this below-expectation rating is provisionally speculated to be due to the fact that respondents have not yet tested the product with their own eyes, hence might not be able to fully acknowledge the drastic rapidity of payment. On a sidebar, the author additionally figures out that younger generations have the proclivity to appreciate this feature of speed more than senior population (correlation between age groups and ratings for speed: $r = -0.113$, $p < 0.05$). The uppermost tier of preference encircles the remaining four advantageous features of Uniqul, i.e. ubiquitousness, eco-friendliness, security and Finnish product, at the mean score of 3.88, 3.99, 4.14, and 4.09 respectively. Within this tier, the author selectively draws attention to the two features of ubiquitousness and security. First, the fairly high score of ubiquitousness partially serves as a justification for the low score of convenience which is mentioned above. The contrast in ratings of these two features suggests that end users are profusely more motivated to adopt Uniqul when the application is widespread on a global scale. Second, regarding security, this feature achieves the highest rating from respondents with over 82% of the responses being "rather interested" and "very interested". This outcome firmly matches with the significant end user unmet need of payment security measures, which has been identified in the theme b.

With reference to the two drawbacks of Uniqul application, it is noticeable that Uniqul monthly subscription fee is a more visible factor that discourages users from adopting the payment application (at the mean rating of 2.36 compared to 2.83 for the top-up account feature). A total of 190 respondents replied that they would be greatly less interested in Uniqul application if it came with a fee rather than being free of charge like other conventional payment methods. Pearson correlation test further reveals that respondents with lower income are slightly more reluctant to adopt a chargeable Uniqul subscription than those that earn more

(correlation between disposable income and ratings for fee: r = -0.95, p < 0.05).

6.2.3 Potential end user demand estimation for Uniqul deployment

This is an augmented section of this sub-chapter where the author attempts to consolidate the end user analysis with an estimated number of potential early adopters of Uniqul face recognition payment application after one year of deployment. Since the survey data have been proven to be unrepresentative for the Finnish population, Bass model, explained in part c, sub-chapter 2.4, shall be alternatively utilized in this circumstance so as to narrow down the deviation gap between the projection and the factual number.

$$N(t) = m \cdot \left(\frac{1 - e^{-(p+q)\cdot(t-t_0)}}{1 + \frac{q}{p} e^{-(p+q)\cdot(t-t_0)}} \right)$$

FIGURE 36. Bass model formula (Bass 1969)

In order to obtain the final number of potential adopters of Uniqul application after one year of deployment N (1), three variables are to be defined:

1. **m**: the market potential: Uniqul targets to acquire end users from every segment of the Finnish population, hence market potential is seen as the entire population of Finland, excluding those who cannot shop for groceries on their own (i.e. age groups: 0 to 10 and above 90) (Statistics Finland 2014, Pisarenko 2013). m, therefore could be calculated as:

m = Finnish population 2016 projection – age group 0 to 10 – age group above 90 = 5,511,625 – 604,309 – 42,986 = **4,864,330**

2 & 3. **p**: coefficient of innovation and **q**: coefficient of imitation: Due to the fact that Uniqul face recognition payment application is a breakthrough innovation, there has not yet been any pre-known coefficients of either innovation or imitation. Hence, in this context, the author shall use the mean diffusion parameters for new consumer technologies, i.e. p = 0.0057, q= 0.4749, as proxy (Pae and Lehmann 2013).

Applying the defined variables into the Bass model formula, we have:

$$N\,(1) = 4{,}864{,}330 * \left(\frac{1-e^{-(0.0057+0.4749)*1}}{1+\frac{0.4749}{0.0057}*e^{-(0.0057+0.4749)*1}}\right)$$

$$\sim \mathbf{35{,}339}$$

The eventual result indicates that after one year of deployment, Uniqul can probably acquire an approximation of 35,339 end users in Finland. It is crucial to bear in mind that the error level of this estimation, though being minimized, is still at a considerable degree by cause of several assumptions made during the calculation process, which are:

1. The mean coefficients of innovation and imitation of new consumer technologies are roughly similar to those of new payment technologies.

2. The early adoption period of Uniqul application lasts for one year.

3. Everyone within the age of 10 and 90 can shop for groceries on their own.

4. No external forces, e.g. retailers, banks, POS providers, and etc., impact the end user adoption process in either a positive or negative way.

6.2.4 Chapter 6 summary and final verdict

This chapter serves as the last puzzle piece of the Finnish grocery retailing market assessment for the deployment of Uniqul face recognition payment application. Hereabouts, the author has conducted analyses on two

customer subsets of grocery retailers and end users, which eventually answer to sub-research question

Q3. *Is there a potential market demand for Uniqul face recognition payment application within the Finnish grocery retailing market?*

On the whole, two salient upshots could be obtained:

First, with regards to grocery retailers, it is observable that hypermarkets and supermarkets, judging from the extent of unmet needs and motivations for adoption, are the most penetrable segment. They possess a considerable need to amend their current matters of customer retention, target marketing and queueing line whilst, in addition, could be susceptibly triggered to adopt Uniqul application by several external forces i.e. customers, competitors, suppliers. Nevertheless, it should be concurrently taken into account that there coexists an implicit “chicken and egg” problem of hypermarkets and supermarkets which could essentially overrule the high penetrability into this segment. In elaboration, this means, supermarkets and hypermarkets are most willing to adopt Uniqul application when either their customers fervently request for the acquisition of the application or other incumbents have already integrated this system. Yet, facts have it that no supermarkets and hypermarkets are eager enough to initiate the adoption process, hence no shoppers will acknowledge, let alone recommend about Uniqul application and no other supermarkets and hypermarkets shall consider acquiring the application. This infinite loop inimically constructs a blockade for the deployment of Uniqul face recognition payment application.

Second, concerning end users, the online survey has primarily exposed that security and ubiquitous convenience are simultaneously two major unmet needs and forceful motivators for the adoption of Uniqul application. In auxiliary, based on users’ responses on payment and shopping habits, it is affirmable that the values offered by Uniqul application fairly befit the routines of Finnish shoppers, given their upper-medium shopping frequency, high tendency to visit different stores, various use of payment means, moderate basket value, and certain familiarity with high technology

payment methods. This, therefore could indicate a high potential for the launch out of Uniqul face recognition payment application. Specifically respecting the deployment phase, the author, on the grounds of the Bass model, projects the number of end users acquired to be around 35,339 individuals.

7 CONCLUSION

This chapter is the final stroke of this thesis, in which the author shall first, provide succinct answers to the sub-research questions as well as to the core research question, then propose his subjective recommendations for Uniqul's imminent course of action and further research ideas to develop the thesis topic. Finally, reliability and validity of this thesis are briefly brought into light. By the end of this chapter, readers can fundamentally comprehend the resolutions for the issues mooted in this study and envision the future development pathway for Uniqul.

7.1 Answers to research questions

As stated in prior, the ultimate purpose of this thesis is to research, analyze and evaluate the Finnish grocery retailing market so as to ready for the deployment of Uniqul face recognition payment application. In pursuance of this objective, a core research question and three sub-research questions have been composed in the Introduction. The author, within this sub-chapter, shall orderly resolve all the defined sub-research questions before tackling the core research question.

Q1. What are the macroeconomic opportunities and threats that Finland poses to Uniqul?

By and large, the Finnish macroeconomic environment appears to be greatly auspicious for Uniqul face recognition payment application, with the beneficial opportunities overshadowing the inimical threats. On the favoring side, Finland boasts substantial governmental facilitations for the development of technological innovations like Uniqul application, conjointly with propitious economic and social settings. On the flip side, the disadvantageous elements are restricted to the complexities in regulations and patenting of the payment industry, and the aging of the Finnish population which increases the reluctance to adopt new technology.

(More detailed answer could be found in Chapter 4 summary and final verdict)

Q2. How intense is the competition in the Finnish payment industry that Uniqul has to face?

Competition in the Finnish payment industry could be gauged as medium in terms of intensity. However, from the perspective of Uniqul, this competition is deemed to be more extreme due to high entry barrier and significant retaliations from major incumbents. The future outlook for Uniqul might hold certain probability of being either acquired by Nets or confronted with a technological race by Verifone.

(More detailed answer could be found in Chapter 5 summary and final verdict)

Q3. Is there a potential market demand for Uniqul face recognition payment application within the Finnish grocery retailing market?

The results harvested from the interviews with grocery retailers along with the internet survey for end users have proven that there does exist a potential market demand for Uniqul face recognition payment application within the Finnish grocery retailing market. This conclusion lays its basis on the identified unmet needs as well as motivations for adoption of the customer subsets. In specific, the author speculates that: regarding grocery retailers, demand could perhaps be sparked from the hypermarkets and supermarkets segment; and in terms of end users, there will be around 35,339 initial adopters.

(More detailed answer could be found in Chapter 6 summary and final verdict)

Core research question: How viable is the Finnish grocery retailing market for the deployment of Uniqul face recognition payment application?

Having taken all aspects of the Finnish macroeconomics and microeconomics as well as the internal competencies of Uniqul application into account, the author believes that the Finnish grocery retailing market is decently viable for the deployment of Uniqul face recognition

application. Nonetheless, if particularly regarding the early introduction phase, the level of market viability could witness a drastic plunge. This is essentially owing to Uniqul's unachieved economies of scale and the "chicken and egg" problem of demand-side forces.

7.2 Recommendations

This sub-chapter serves as the value-generating part of this thesis where the above market insights shall be harnessed and converted into recommendations for Uniqul's upcoming strategy as well as for future research ideas to develop the topic.

a. Recommendations for Uniqul's upcoming strategy

On the fulcrum of the erected Finnish grocery retailing market assessment, the author shall lay out brief recommendations on what Uniqul should do in approaching short and medium terms in order to either take advantage of the external settings or alleviate the hindrances, thereby enhance the viability of Uniqul application. The recommendations are tabulated in the ensuing Table 7 for the ease of reading.

TABLE 7. Recommendations for Uniqul's upcoming strategy (short to medium term)

	Market Insights	**Recommendations**	**Risks involved**
Short term (3 – 6 months)	1. Finnish Governmental facilitation for technological innovations, eco-friendly technologies,	Apply for funding from state agencies e.g. Tekes, Finnvera, Academy of Finland to partly cover overhead costs (Opening application for Horizon 2020 Funding Program)	Since Uniqul has already received funding from Tekes, certain proof about the viability and progress of the

	non-cash payment solutions		application is required.
		Consult experts at Tekes, Academy of Finland for guidance and networking	
		Participate more fervently in networking events e.g. Slush, Fintech and banking conferences to look for partnerships as well as domestic and foreign angel investors	
	2. Complex regulations and standards in payment industry	Consult legal supervisors to ensure the fulfilment of current and prospective legislative requirements for payment technology in Finland and on international level, before the deployment of Uniqul application	
	3. Grocery retailers' need of loyalty feature	Invest in developing an augmented feature of customer retention program for Uniqul application	This enhancement process might be time- and resource-consuming.
	4. Grocery retailers' utility skepticism/ the "chicken and egg"	Launch Uniqul application in another market e.g. restaurants and coffee shops, hotels and resorts, to acquire Uniqul's initial	Uniqul has to invest into further analyses to select the best

	problem of grocery retailers	testimonies of operability as well as to accumulate the first sales, thereby increase Uniqul's credit ratings.	market to deploy the application.
		Launch a piloting session of Uniqul application at K-citymarket Paavola to demonstrate its operability and to collect users' feedbacks	The decision process of K-citymarket to approve Uniqul's piloting session might be long.
		Increase Uniqul's presence on mass media by contacting journalists and revitalizing Uniqul's social media channels	
	5. Various correlations between end user segments with unmet needs and motivations for adoption	Devise suitable target marketing strategies for different end user segments (e.g. promoting Uniqul feature of convenience and accuracy to younger users, feature of security to lower-income users, etc.)	Further end user analysis is to be conducted in order to gain more accurate and population-representable insights.
Medium term (6 - 18 months)	6. Requirements of economies of scale and brand identification in the Finnish payment industry		

	a. - Lower medium bargaining power of acquirers - Grocery retailers being demotivated by the coexistence of both credit card processor and Uniqul face recognition payment application - End users being dissatisfied by Uniqul's top-up account feature	Partner with acquiring and issuing banks in Finland, first to exploit the banks' current merchant and personal accounts, then to legitimately link Uniqul application with both users' and retailers' bank accounts, thereby simplify Uniqul payment process to the conventional plastic card payment process	Most banks in Finland either have had their outsourced payment providers or would prefer larger-scale payment processors. There might be significant skepticisms from banks about the security of Uniqul application.
	b. - High bargaining power from buyers - Grocery retailers being demotivated by the complexities in data management and system integration - Small grocery retailer segment being in need of inventory management functionality	Partner with POS providers e.g. Vend POS to take advantage of their existing customer base, while concurrently being able to offer grocery retailers with full-stack POS system	Uniqul might have to concede several benefits to the POS providers since the company is the weaker party in the negotiation.

	c. Certain possibilities of retaliation from major incumbents	Accept to be acquired by Nets (or other incumbents) before being encountered by more atrocious actions from other contenders (price race, technological race)	The possibility of proposals for acquisition is not definite.

b. Recommendations for further research

This study is merely a fraction of the market assessments needed for the deployment of Uniqul face recognition payment application. Hence, it could be bettered in both horizontal and vertical dimensions with further research.

On the first half of horizontal dimension, this study could be expanded with analyses of other markets that Uniqul could possibly penetrate. The author tentatively suggests the considerations of cinema and theatre market, hotel and resort market, education institution market, and restaurant and coffee shop market.

On the second half of vertical dimension, this thesis could be supplemented with a more elaborate and large-scale customer analysis of the grocery retailing market. This means, interviews could be conducted with more grocery retailing store managers and upper management tiers of hypermarket and supermarket chains, whereas the sampling population of the end user survey could be extended to be representable for the Finnish population.

7.3 Reliability and validity

In the context of a business research, reliability and validity fundamentally refer to the credibility of the yielded findings. While reliability is concerned with the extent to which the data collection techniques and analyzing process will generate consistent findings on different occasions and by

different researchers, validity indicates the soundness of the findings, or to put it simply, how accurately the findings response to the research questions. (Saunders, et al. 2009.)

The author is confident that this research is moderately reliable regarding the collection and analysis of both qualitative and quantitative data. Qualitative data are first collated from semi-structured interviews with a retailer of Kesko Group - one of the two largest hypermarket and supermarket chains of Finland, in addition to a store manager of an Asian specialty deli in Helsinki, and are subsequently transcribed and sent for confirmation from the interviewees. This process ensures precise understanding and interpretation of the interviewees' responses. As for quantitative data, despite the unrepresentativeness of the survey population, the author has supplemented the survey deficits and reconfirmed the data accuracy with ethnographic observations at various stores in Lahti and Helsinki within the whole month of December. Both of these survey and ethnographic data are then processed with standard and carefully-administered statistical techniques. Therefore, all in all, it could be believed that similar results shall be achieved by studies done on other occasions and by other researchers.

In terms of validity, the author has constantly assured that the findings are solid during this research procedure. Primary data are harvested in high pertinence to the defined objectives and research questions. Furthermore, data triangulation are explicitly maintained throughout the primary data analyzing process by complementary utilization of interviews, survey and ethnography data. With reference to secondary data, the author has managed to employ information and statistics exclusively from published books, certified reports, academic journals, and trustworthy internet sites, which are mostly issued no earlier than 2010. As a result, the thesis outcomes are not only valid but also up-to-date.

8 SUMMARY

Over the last decade, the global payment industry has been undergoing a massive paradigmatic metamorphosis, evolving from an economically-burdensome and problematic cash orientation to an effective and efficient cashless model. This has opened up a whole new horizon, a clear “blue ocean” for payment innovations. Realizing the vast opportunities that the circumstance has to offer, the author has written this thesis as a reference for Uniqul Oy to assess the potentials of the Finnish grocery retailing market for the deployment its breakthrough face recognition payment application.

This thesis comprises two main parts: theoretical and empirical part.

The theoretical part spans from Chapter 2 to Chapter 3 where the author explicates the market assessment tools (PESTLE analysis, Porter’s Five Forces, competitor analysis, and customer analysis) as well as the features of Uniqul face recognition payment application.

The empirical part is covered in Chapter 4, Chapter 5, and Chapter 6. Hereabouts, the author, first conducts desk research on the macroeconomic environment of Finland in Chapter 4, and the competitive scenario of the Finnish payment industry in Chapter 5. Then, he proceeds to analyze the Finnish customers within the Finnish grocery retailing market in Chapter 6, based on pre-collated qualitative data from interviews with grocery retailers, and quantitative data from internet survey with shoppers and ethnographic observations at several stores in Finland.

At the end of this thesis, all findings are presented in the forms of answers to the core and the sub-research questions. The initially-proposed hypothesis that the Finnish grocery retailing market is decently viable for the deployment of Uniqul face recognition payment application is justified. The author, in auxiliary, has proven that the findings are moderately reliable and highly valid, and further suggests that other market assessments and in-depth customer analysis should be keenly conducted before the final deployment decision is made.

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APPENDICES

APPENDIX 1. Estimated Proportion of Payment Processing Cost in Retailers' Budget per Year (Based on Kesko 2014, Verifone Assistant 2015, Finanssialan Keskusliitto 2011, Finnish Grocery Trade Association 2015).

Costs		
Fixed Costs	Price per payment terminal (Taken from Verifone Vx 610)	EUR 580
	Depreciation per annum (Common rate for assets 20%)	EUR 116
	Fixed service fee	EUR 120
	One time activation fee	EUR 33
	Annual fixed cost (=(Depreciation per annum + Fixed service fee + (One time activation fee/5)) * number of stores * average number of terminals per store)	= EUR 243 * 929 * 5= EUR 1.2 million
Variable Costs	Debit Card Transaction Discount Rate	0.69% + EUR 0.2
	Total Value of Debit Card Transactions/ Year (= Total sales * Proportion of EFTPOS transactions * Proportion of Debit Card transactions)	= EUR 4,754 million * 54% * 66.3% = EUR 1,702 million

	Total Number of Debit Card Transactions/ Year (= total Value of Debit Card/ Basket Value)	= EUR 1,702 million/ EUR 22.1 = 77 million
	Annual Debit Card Transaction Fee (= total Value of Debit Card * 0.69% + total Number of Debit Card * EUR 0.2)	= EUR 1,702 million * 0.69% + 77 million * EUR 0.2 = EUR 27.1 million
	Credit Card Transaction Discount Rate	1.69% + EUR 0.2
	Total Value of Credit Card Transactions/ Year	EUR 865 million
	Total Number of Credit Card Transactions/ Year	39 million
	Annual Credit Card Transaction Fee	EUR 22.4 million
	Annual Payment Processing Fee for Debit and Credit Cards	EUR 49.5 million
	Estimated Proportion of Payment Processing Fee in Retailers' Budget per Year (= (Annual Payment Processing Fee for Debit and Credit Cards + Annual Fixed Costs) / Total Annual Purchase)	= (EUR 49.5 million + EUR 1.1. million) / EUR 8.839 million = 0.57%

APPENDIX 2. Pearson Chi-square Test and Pearson Correlation Tests for Age Groups and Loyalty Cards

Crosstab

Count

		IDs and Licenses		Total
		No	Yes	
Age Groups	1	9	5	14
	2	143	130	273
	3	27	26	53
	4	0	6	6
	5	5	0	5
Total		184	167	351

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27.462[a]	4	.000
Likelihood Ratio	33.441	4	.000
Linear-by-Linear Association	9.058	1	.003
N of Valid Cases	351		

a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is 1.55.

Correlations

		Loyalty Cards
Age Groups	Pearson Correlation	.161**
	Sig. (2-tailed)	.003

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX 3. Pearson Chi-square Tests and Pearson Correlation Tests for Age Groups and Basket Value, Disposable Income and Basket Value

Chi-square Test for Age Groups and Basket Value

Crosstab

Count

		And also your basket value - the amount of money spent per time you shop?					Total
		0	1	2	3	4	
Age Groups	1	6	5	3	0	0	14
	2	11	92	134	32	4	273
	3	3	0	29	18	3	53
	4	0	0	3	0	3	6
	5	0	0	4	1	0	5
Total		20	97	173	51	10	351

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	129.951[a]	16	.000
Likelihood Ratio	92.982	16	.000
Linear-by-Linear Association	43.157	1	.000
N of Valid Cases	351		

a. 16 cells (64.0%) have expected count less than 5. The minimum expected count is .14.

Chi-square Test for Disposable Income and Basket Value

Crosstab

Count

		And also your basket value - the amount of money spent per time you shop?					Total
		0	1	2	3	4	
We'd also love to know about your income level (disposable income)	1	19	93	140	35	2	289
	2	3	2	22	6	5	38
	3	0	0	11	4	0	15
	4	0	0	0	3	3	6
Total		22	95	173	48	10	348

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	95.575[a]	12	.000
Likelihood Ratio	67.023	12	.000
Linear-by-Linear Association	37.928	1	.000
N of Valid Cases	348		

a. 11 cells (55.0%) have expected count less than 5. The minimum expected count is .17.

Pearson Correlation tests

Correlations

		Age Groups	We'd also love to know about your income level (disposable income)	And also your basket value - the amount of money spent per time you shop?
Age Groups	Pearson Correlation	1	.595**	**.351****
	Sig. (2-tailed)		.000	.000
We'd also love to know about your income level (disposable income)	Pearson Correlation	.595**	1	**.331****
	Sig. (2-tailed)	.000		.000
And also your basket value - the amount of money spent per time you shop?	Pearson Correlation	.351**	.331**	1
	Sig. (2-tailed)	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

APPENDIX 4. Interview questions framework for grocery retailers in Finland (Semi-structured approach)

Note: The questions were modified with each interviewee.

Part 1. Revealing unmet needs

(Interviewee is not yet briefed about Uniqul face recognition payment application)

1. How many sales counters and cashiers are there in your store? Have you encountered any problem related to the queueing line i.e. overloaded? Is the same applied for special events e.g. Christmas, New Year? How is the cashier rotation managed? How are unanticipated issues resolved?

2. How do you evaluate your current practices of customer retention and target marketing? Are you employing any loyalty program? If yes, how is it going?

3. Have you encountered any payment card fraud in your store? How do you view that issue?

4. How long does a cashier training session last? After this session, how proficient are they to maneuver the POS system?

Part 2. Revealing motivations for adoption

(Interviewee is now briefed about Uniqul face recognition payment application)

1. Do you identify any serious matter in your store that needs to be ameliorated?

2. How willing are you to adopt Uniqul application (on the scale from 1 to 5, with 1 being “not so willing” and 5 being “very willing”) if:

a. Uniqul is popularized on credible mass media e.g. CNN, BBC?

b. A large number of boutiques and stores (not grocery retailing) have already adopted Uniqul?

c. A considerable amount of customers start complaining about the existing payment system and suggest the adoption of Uniqul?

d. Your competitors have already adopted Uniqul?

e. Uniqul is ecological and from Finland?

3. What is the process of acquiring a new payment system in your store? Who are in charge of making the decision? What is the estimated length of time for an adoption?

4. What features of Uniqul do you like most? What features of Uniqul do you think should be improved or eradicated? Can you elaborate?

5. The price of Uniqul is XXXX Euros per piece, XXXX Euros per transaction/ face recognition, XXXX Euros per month. Monthly customer subscription fee is XXXX Euros. Do you see that as reasonable?

End impression: In a nutshell, how interested are you in Uniqul face recognition payment application? Do you see your store adopting it in the near future of 2 to 3 years?

APPENDIX 5. Internet survey with shoppers in Finland

(Full survey with illustrations could be retrieved at: https://bachnhatduc.typeform.com/to/raFKdx)

UNIQUL MARKET RESEARCH

Hey there! My profuse appreciation since you have reached here after such a long journey *salute comrade*. You are about to embark on a top-secret mission.. er just kidding.., actually a small survey on your payment habits. This is essentially vital for us - Uniqul Oy - before we could officially launch the world-first face recognition payment technology - the next pride of Finland.

LET'S ROLL press ENTER

" A sneak-peak about the technology:

Uniqul operates in a way that: first, you sign up for Uniqul at the cashier, camera captures your face configurations, sends to cloud-database. Next time when you shop, Uniqul will recognize you in 1 second as you stand and wait for the cashier to scan the barcode. You press ok to confirm, payment done. As simple as that!

Continue press ENTER

1. Right! First off, let us get to know something about you. How about your age?

A Young, wild and free: your age < 18
B Relatively young: 18 < your age < 25
C Still energetic: 25 < your age < 40
D Have got salt-and-pepper hair: 40 < your age < 60
E Old but solid gold: your age > 60

2. Sex? - I mean "sex" as in your "sex & gender"

A Male
B Female

3. We'd also love to know about your income level (disposable income)

A < 1200 EUR /month
B 1200 EUR < x < 3000 EUR /month
C 3000 EUR < x < 5000 EUR /month
D > 5000 EUR /month

4. Last but not least, the place where you have automatic Wifi connection - I mean "Where do you live in Finland?"

5. Could you also tell us a tidbit about your payment habits, like what stuff is there in your wallet?

A Cash
B Credit and Debit Cards
C Loyalty Cards
D IDs and Licenses
E The I-don’t-want-to-list-out stuff

6. Nice so how many cards (licenses, IDs, Credit Cards, Debit cards...) do you have in total?

7. Great! How about your shopping habits? How many times do you shop in a grocery store per week?

A 1-2 times
B 3-5 times
C 5-9 times
D Too many I can't even count

8. Do you shop in different grocery stores per shopping time?

A Yes
B No

9. And also your basket value - the amount of money spent per time you shop?

A 0.05 EUR - 10 EUR
B 10 EUR - 25 EUR
C 25 EUR - 50 EUR
D 50 EUR - 150 EUR
E > 150 EUR
F It varies. From pennies to millions.

10. Side question: Have you ever tried Visa Paywave, Mobie NFC Payments or any other hi-tech payment methods?

A Yes
B No

11. Brilliant! Rating time now. One the scale of 1 to 5 cats, with 1 cat being I am worried and 5 cats being I am damn confident, how much do you rate the security of the payment methods you are using (the level of protection, the likelihood of frauds and thefts,...)

12. How about convenience? One the scale of 1 to 5 cats, with 1 cat being I hate it and 5 cats being I am satisfied to the very last drop, how much do you rate the convenience of the existing payment methods

(considering the actions you need to carry out to pay, the equipment and devices involved, etc.)

13. Speed of payment? (How fast is the processing time?)

14. And the accuracy of payment (the times it did not work properly e.g. your credit card messed up for 5 minutes)

15. Last set of questions for the day. This is all about your ratings for our upcoming product.

One the scale of 1 to 5 with 1 being "nah, not interested" and 5 as "Cool, I will surely try it", how willing are you to adopt the product if

1. You can pay with Uniqul hands-free, no need of wallet or phone or PIN codes or signatures, just with your face configurations.

2. Your friends are using Uniqul, your parents are using Uniqul, and your archrival is using Uniqul.

3. Payment takes 1 second instead of the orthodox 30 seconds

4. You have to top-up your account once in a while i.e. every time you run out of balance, you have to reload. Uniqul does not connect with your bank cards.

5. You can pay at every location that accepts Uniqul - by “every”, I mean around the globe!

6. Uniqul has been verified and featured on CNN, Huffington Post, Mashable, Yle, Helsingin Sanomat, etc.

7. You can sign up for Uniqul directly at the cashier counter at any grocery retail.

8. You have to pay a fee of 2 euros per month if you want to pay in all stores accepting Uniqul in a city, 5 euros per month for Finland and 15 euros for the other nations.

9. You don't have to show your IDs to buy alcoholic drinks in Finland

10. Uniqul is eco-friendly. We help reduce technological waste from excess machines and cards.

11. Uniqul is highly-secured. We offer a three-layer security system that is more advanced and safer than any other payment methods.

12. Uniqul is from Finland!